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CITY OF MANCHESTER.

REPORT

ON THE

Health of the City of Manchester,

1899.

BY

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PUBLIC HEALTH OFFICE,
TOWN HALL, MANCHESTER.
SEPTEMBER 22nd, 1900.

MY LORD MAYOR, ALDERMEN, AND MEMBERS
OF THE CITY COUNCIL.

I have the honour to submit to you my Report on the Health of Manchester for the year 1899.

The record of mortality for that year is high, viz., 23·9 per thousand, according to our estimate. It is lower than in 1893 or 1895, but is considerably higher than in 1896, 1897, and 1898. The excess is chiefly to be found under Measles, Summer Diarrhœa, and Influenza, with its allied causes, Heart Disease and Pneumonia.

An analysis of the causes of this high death-rate seems to show that it arises not from overcrowding, nor in largest measure from chemical pollution of the atmosphere, but more especially from contamination of the soil in one way or another—so far, that is, as it depends on causes removable by the Sanitary Authority.

In some parts of the City, during last year, the atmosphere was unduly contaminated, and four prosecutions were successfully instituted.

During 1899, powers were obtained in Parliament for dealing with Tuberculous Milk produced in the City or introduced from without.

A scheme for the Notification of Phthisis was also passed by the City Council.

An account is given in this Report of the earlier proceedings under both these heads.

No new provision has as yet been settled upon for the treatment of Smallpox, which has lately visited a number of Lancashire towns.

The additions to the Monsall Hospital are now nearing completion.

A Special Report on Common Lodging-houses, made to the Sanitary Committee, is incorporated.

The attention of the Sanitary Authority will be engaged with several important subjects during the coming year.

Amongst these, the removal of insanitary dwellings and the provision of healthy houses for the poor will occupy much of their attention.

Additional provision for treating cases of Smallpox has become requisite.

It will be necessary to improve on the present modes of disinfection, by way of addition rather than alteration.

The alteration of many grossly insanitary closets is much needed.

It is desirable that we should proceed to deal more rapidly with milkshops and ice cream makers, and a strenuous effort should be made to improve on the conditions of infant feeding.

I have the honour to be,
My Lord Mayor, &c.,
Your obedient Servant,
JAMES NIVEN,
Medical Officer of Health.

TABLE OF CONTENTS.

PAGE

Vital Statistics 1–19

Notified Infectious Diseases 20–21

Smallpox 21–23

Scarlet Fever 23–40

Tables regarding 24–27

Bacteria in the soil 27

Connection with defective privies 28

Return cases of 29–33

School infection 33–40

Diphtheria and Membranous Croup 41–54

Tables regarding 41–43

Prevalence in Autumn 44

Incidence on City 44

Distribution 44

Bacteriological examination of membrane from cases of ... 45

Return cases 48

Direct infection 48

Paralytic complications in 49–51

Influence of schools 52

Relation to food supply 52

Fouling of the ground and closets 52

Insanitary conditions associated with 52–54

Enteric or Typhoid Fever 54–76

Tables regarding 54–57

Seasonal wave 58

Direct infection 59–67

On the persistence of growth of the bacillus in the soil ... 67–69

Shell fish and 70–72

Ice cream and 72–73

School infection 73

And closets 74–76

Measles 77–89

Tables regarding 77–78

And schools 78–89

WHOOPING COUGH 90–92
  Tables regarding 90–91
SUMMER DIARRHŒA 92–104
  Tables regarding 92–94
  Effect of season 95
  Chart 102
VOLUNTARY NOTIFICATION OF PHTHISIS 104–125
  Administration 109
  Cleansing and disinfection 113
  Ætiology of 114
MILK AND TUBERCULOSIS 125–141
  Manchester cowsheds 131
  Manchester cows 132
  Tuberculous milk 135
COMMON LODGING-HOUSES 142–160
BAKEHOUSES 161
HOUSING OF THE WORKING CLASSES 162–167
LEGISLATION AS TO PERSONAL CLEANLINESS 168
EFFLUVIUM NUISANCES 168
THE DANGER OF THE IMPORTATION OF PLAGUE 169
WORK OF THE LADIES' HEALTH SOCIETY 169–172
WORK OF THE LADIES' SOCIETY FOR VISITING THE JEWISH POOR ... 169–172
WORK OF SPECIAL JEWISH HEALTH VISITOR 172
MEDICAL SUPERINTENDENT'S REPORT ON MONSALL HOSPITAL 172–183
WORK OF SANITARY DEPARTMENT 183–201
WORK OF CLEANSING DEPARTMENT 201
WORK OF MARKETS DEPARTMENT *re* UNWHOLESOME FOOD 203–205

LIST OF TABLES.

TABLE PAGE

1. 1899—Recorded and Corrected Death-rates in the 33 Towns 2

2. Do. Prices of Flour, Butchers' Meat, and Coal 4

3. Do. Deaths in Public Institutions 7

4. Do. Death-rates in Manchester at various age-groups in 1899 compared with Manchester, 1891-1898, and England and Wales, 1881-90 10

5. Do. Recorded and Corrected Death-rates of Manchester in Districts 13

6. Do. Death-rates in the Homes of the People, in Workhouses, and in Hospitals.. 14

7. Do. Average Annual Rates of Mortality from certain causes in Divisions and Districts for 1891-98 compared with 1899 ..16–17

A. 1899—Causes of Mortality at certain age-groups 208–211

B. Do.—Summary of preceding Table 212

C. Do.—Causes of Mortality of Males, at age-groups 213

D. Do. do. Females, do. 214

E. Do.—Causes of Mortality in Infancy and Childhood 215

F. 1871–99—Population; Marriage, Birth, and Death Rates 216

G. 1881–99—Rates of Mortality from certain causes 217

H. 1899—Population Area, Density, Births, and Deaths, with Rates... 218

J. Do.—Illegitimacy and Infantile Mortality 219

K. Do.—Infantile Mortality in Divisions.................................. 220

L. Do.—Mortality from all causes, in Divisions 221

M. Do.—Mortality at age-groups (City) 222

N. Do.—Division of City—Mortality by age and cause.................. 223

O. Do.—Certification of Cause of Death 224

P. Do.—Patients admitted to Isolation Hospitals 225

Q. Do.—Work of Sanitary Department 226

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ANNUAL REPORT.

STATISTICAL.

The more outstanding figures relating to the year 1899 are as follows :—

Estimated population by the Registrar-General...		546,010
Persons married in Manchester, Prestwich, and Chorlton Unions		12,122
Annual rate of persons married per 1,000 of population..		18·4
Births ...	Males......... 8,919 Females...... 8,655	17,574
Annual rate of births per 1,000 of the population...		32·2
Deaths...	Males......... 6,684 Females...... 6,362	13,046
Annual rate of mortality per 1,000..................		23·9
Excess of registered births over deaths		4,528
Estimated increase of population during the year		4,714

The principal causes of death during the year were :—

Tubercular Disease	1,580
Pneumonia..................	1,536
Bronchitis	1,290
Diarrhœa and Simple Cholera	1,121
Diseases of the Circulation	1,090
Measles	699
Debility, Inanition	697
Diseases of the Digestive System	543
Cancer	408
Premature Birth	377
Apoplexy	285
Whooping Cough............	227
Old Age	225
Influenza	219
Convulsions	193
Inflammation of Brain	166
Insanity........................	166
Bright's Disease	150

The death-rates of the 33 large towns, in their crude form, and as corrected for sex and age distribution, are shown in the following table, extracted from the Registrar-General's Annual Summary :—

TABLE 1.—RECORDED AND CORRECTED DEATH-RATES PER 1000 PERSONS LIVING IN 33 GREAT TOWNS DURING THE YEAR 1899.

TOWNS in the order of their Corrected Average Death-rates	Standard Death-rate	Factor for correction for Sex and Age distribution	Recorded Death-rate, 1899	Corrected Death-rate, 1899	Comparative Mortality Figure, 1899
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
England and Wales	19·15	1·0000	18·33	18·33	1,000
England and Wales less the 33 Towns	19·45	0·9845	17·29	17·02	929
33 Towns	17·71	1·0813	20·19	21·83	1,191
Croydon	18·37	1·0424	15·04	15·68	855
Norwich	19·99	0·9579	17·29	16·56	903
Cardiff	17·16	1·1159	15·42	17·21	939
West Ham	17·75	1·0788	16·71	18·03	984
Derby	17·36	1·1031	16·93	18·68	1,019
Huddersfield	16·47	1·1627	16·19	18·82	1,027
Bristol	18·45	1·0379	18·25	18·94	1,033
Brighton	18·94	1·0110	18·95	19·16	1,045
Leicester	17·64	1·0855	17·71	19·22	1,049
Swansea	17·53	1·0924	18·15	19·83	1,082
Portsmouth	18·73	1·0224	19·70	20·14	1,099
Gateshead	17·83	1·0740	18·79	20·18	1,101
Hull	18·23	1·0504	19·30	20·27	1,106
Halifax	17·20	1·1133	18·25	20·32	1,109
Birkenhead	17·42	1·0993	19·16	21·06	1,149
London	17·97	1·0656	19·78	21·08	1,150
Plymouth	19·70	0·9720	21·72	21·11	1,152
Bradford	16·73	1·1446	18·44	21·11	1,152
Leeds	17·28	1·1082	19·14	21·21	1,157
Blackburn	17·05	1·1231	19·13	21·48	1,172
Nottingham	17·81	1·0752	19·99	21·49	1,172
Newcastle	17·58	1·0892	20·56	22·39	1,221
Sunderland	18·25	1·0493	21·48	22·54	1,230
Bolton	16·90	1·1331	19·89	22·54	1,230
Burnley	16·67	1·1487	19·63	22·55	1,230
Wolverhampton	18·30	1·0464	21·81	22·82	1,245
Birmingham	17·33	1·1050	20·84	23·03	1,256
Oldham	16·72	1·1453	20·47	23·44	1,279
Sheffield	17·22	1·1120	22·16	24·64	1,344
Preston	17·42	1·0993	22·84	25·11	1,370
Salford	17·03	1·1244	23·80	26·76	1,460
Manchester	16·90	1·1331	24·61	27·89	1,522
Liverpool	17·44	1·0980	26·38	28·97	1,580

On comparing these figures with those of former years, we find that the Manchester death-rate for the year 1899 is higher than in any of the three previous years. Not only is it higher absolutely, but the position of Manchester is relatively worse to other towns, the death-rate being only exceeded by that of Liverpool. There is a slight diminution in the marriage and birth rates, but nothing sufficient to show that there is any reflux in the wave of prosperity which the country has been lately enjoying.

The above summary of the chief causes of death shows that the increased mortality of the year is principally in the chest diseases designated bronchitis and pneumonia, in influenza, and in measles.

We have seen from previous reports that the most outstanding cause of death in Manchester is lung disease, and the conditions favouring mortality from this were emphasised during the past year, while measles again exacted a very heavy toll from infant life.

In 1899, also, the number of deaths from insanity is higher than in any recent year. This deserves serious attention, but as the number of deaths was unusually small in 1898, it is permissible to regard it as merely the result of a transfer from one year to another.

It is probable that the population of the city as estimated by the Registrar-General is under the mark; but a calculation made in 1898 on the basis of inhabited houses as given by the rate books brought out a result only slightly in excess of the estimate of the Registrar-General.

Since that time, however, houses have continued to increase at such a speed that one of two things must have happened: either the average number of persons to a house must have diminished, or the population must exceed the estimate of the Registrar-General.

If, again, the suspicion that overcrowding has increased seriously is correct, the population must greatly exceed both estimates.

We shall have to wait for the Census to settle these questions.

The probability is, however, that the population is moderately in excess of the estimated number, and that there is a slight increase in the average number of persons per house. This would arise, in part, from the number of back-to-back houses which have been closed, since these have necessarily a smaller average number of inhabitants than houses containing more rooms.

Another reason for suspecting that the population is under estimated is this. The natural increase of population has considerably exceeded the annual increase as estimated by the Registrar-General, and, if we take into account the undoubted prosperity of recent years, it is not likely that there has been an outward current, but the reverse.

It is a singular fact, considering the rarity of empty houses in 1898 as compared with 1891, and considering the great number of new houses erected in recent years, that the estimate of population in 1898, on the basis of inhabited houses, did not materially exceed that of the Registrar-General.

TABLE 2.—TOWNSHIP OF MANCHESTER.—PRICES PAID BY THE GUARDIANS FOR FLOUR, BUTCHERS' MEAT, AND COAL; ALSO THE AVERAGE NUMBER OF PERSONS IN RECEIPT OF RELIEF DURING THE YEARS 1887–1899.

YEAR ENDING	PRICES OF PROVISIONS						PAUPERISM		BIRTH-RATE PER 1,000
	Flour per Sack of 280lbs.	Butchers' Meat, per lb.			Coal, per ton		Average number of Paupers relieved in each week		
		Beef		Mutton	Engine	House			
		Coarse	Fine				Indoor	Outdoor	
1887	25/2 to 30/6	-/3¾	-/6½	-/6½	5/6	8/4	3123	877	33·9
1888	24/- to 29/3	-/3¾	-/6½	-/6½	5/5	8/3	3130	713	33·3
1889	24/11 to 31/2	-/4½	-/6½	-/6½	5/8	8/7	3037	632	33·1
1890	24/9 to 29/11	-/5	-/7	-/7	7/-	9/9	2998	498	31·8
1891	27/3 to 28/11	-/4¼	-/6½	-/6½	8/8	11/2	3118	466	33·8
1892	26/4 to 28/5	-/4	-/6¼	-/6¼	7/6	10/2	3251	551	33·4
1893	21/8 to 25/1	-/3⅞	-/6¼	-/6¼	6/5	10/0	3277	586	33·4
1894	17/2 to 23/9	-/3¾	-/6	-/6	7/1	10/10	3328	395	31·8
1895	15/6 to 21/-	-/3¾	-/6	-/6	5/6	10/3	3343	618	33·4
1896	16/6 to 24/-	-/3⅝	-/5¾	-/5¾	5/7	9/1	3348	533	32·8
1897	17/3 to 33/9	-/3½	-/5⅝	-/5⅝	5/9	8/8	3476	697	32·9
1898	26/7 to 33/8	-/3½	-/5½	-/5½	6/2	8/4½	3519	732	32·3
1899	20/11 to 23/-	-/3½	-/5⅝	-/5⅝	7/5	9/11	3232	597	32·2

The general condition of the population as regards the elements which ought to go far to make a healthy people may be roughly determined by the average wages of the unskilled labourer, the prices of the staple articles of food, etc., and the amount of pauperism.

As regards the staple articles of food, the year 1899 witnessed an improvement in the price of flour, with no material increase in the price of meat (as shown in Table 2), so that the balance is slightly to the good.

But, on the other hand, the price of coal rose considerably, so that on the whole a given wage purchased less of the prime necessities of life than in 1898.

In 1899 the number of indoor paupers relieved was less than in any year since 1891, and the number who received outdoor relief in the Township of Manchester was considerably less than in 1897 and 1898. These figures show that employment during 1899 must have been fairly steady and remunerative, especially when the high price of coal and the high rental of houses are taken into account.

If, now, we compare the death-rates of the year 1899—not with those of 1898, but with the average rates of the previous eight years—we find that there is an adverse balance of 1 per 1000, or, on a population of 546,000, of 546 deaths.

The gains and losses in 1899, compared with the average in the previous 8 years, are shown in detail in the following tables :—

Gains in 1899 per 1000 persons living.

Scarlet Fever	0·17
Whooping Cough	0·17
Diphtheria	0·05
Enteric Fever	0·10
Puerperal Fever	0·04
Rheumatic Fever	0·01
Phthisis	0·01
Tubercular Disease other than Phthisis	0·06
Old Age	0·06
Brain and Nervous Diseases	0·29
Bronchitis	0·07
Other Respiratory Diseases	0·08
Digestive Organs	0·07
Urinary Organs	0·04
Total	1·22

Losses in 1899.

Measles	0·55
Influenza	0·14
Diarrhœa	0·71
Rickets	0·01
Cancer	0·09
Premature Birth	0·09
Heart Diseases	0·23
Pneumonia	0·41
Total	2·23
Balance of Loss	1·01

The actual balance of loss on the items enumerated is 1·01 per 1000.

It will be seen that the number of gains exceeds the numbers of losses, and that the latter occur under diarrhœa, pneumonia and influenza, measles, and heart disease.

It is difficult to dissociate pneumonia from influenza on the one hand and from measles on the other, or to dissociate heart disease from the first two causes of death. The heart disease is not likely to have arisen from rheumatic fever, since there is no evidence of a tendency to increase under that heading. It may be assumed that these causes of death should be associated. But it must be admitted that the great fatality from measles which we have experienced in recent years calls for special action. Over influenza it is even more difficult to exercise any control. On the other hand, a slight improvement is manifested in all those diseases over which we may be assumed to have some measure of control—scarlet fever, diphtheria, enteric fever, puerperal fever, tuberculosis, brain and nervous diseases, and also under bronchitis.

The control exercised under nervous diseases arises chiefly under the heading convulsions, which is undoubtedly largely a matter of the feeding of infants, and in which great improvement is shown year by year.

There is, however, one cause of death which stands out as excessive, viz., summer diarrhœa. For two successive years it has exacted a terrible mortality. The factors contributing are not so well defined as might be wished, but this much is certain, that a polluted soil has an intimate relation with a high death rate from diarrhœa.

The proportion of deaths occurring in public institutions was somewhat higher than in 1898, viz., 19·7 per cent., as against 19·5 per cent. in the previous year. The increase was almost entirely due to the increase in deaths at the Union Infirmaries, and was determined, no doubt, by the wave of influenza which passed over the city, and which was especially severe on the poor. There was also an increase in the number of deaths occurring in the Ancoats Hospital. The number of deaths is shown in the following table:—

TABLE 3.—POPULATIONS—DEATHS OF MANCHESTER RESIDENTS, 1899, IN PUBLIC INSTITUTIONS.

Township	NAME OF INSTITUTION	Population, 1891	Deaths, 1899
ANCOATS	Ancoats Hospital	64	126
	Workhouse Casual Wards (Tame Street)	...	1
CENTRAL	Workhouse Casual Wards	167	8
	Royal Infirmary	260	291
	St. Mary's Hospital	27	13
	Lock Hospital	25	...
	Eye and Ear Hospital	7	4
	Alsop's Boys' Home	11	...
	St. Joseph's Girls' Home	17	...
	Chetham Hospital	100	...
	Mission Refuge (St. John's Parade)	8	...
	Consumption Hospital	...	...
	Children's Hospital (Gartside Street)	...	...
ST. GEORGE'S	Girls' Home (Charter Street)	21	...
CHEETHAM	Her Majesty's Prison	922	4
	Boys' Refuge	185	...
	Girls' Friendly Society	18	..
	Clinical Hospital	36	68
	Fairy Hill Home for Working Lads	...	1
CRUMPSALL	Manchester Workhouse	2,608	923
*	Prestwich Workhouse	305	146
BLACKLEY	Manchester and Salford Reformatory	76	...
	Litchford Hall	152	11
	Well's House Convalescent Home	10	...
MOSTON	St. Mary's Home	...	1
	St. Joseph's Home	34	...
	St. Bridget's Orphanage	32	1
NEWTON	Monsall Hospital	185	113
	Little Sisters of the Poor (Culcheth Hall)	107	11
CLAYTON	Clayton Smallpox Hospital	...	...
ARDWICK	Industrial School	203	...
	Nicholls Hospital	100	...
OPENSHAW	Crossley's Home	...	16
RUSHOLME	St. Joseph's Girls' School	150	1
	St. Mary's Home	28	...
CHORLTON-ON-MEDLOCK	St. Joseph's Boys' School	413	1
	Royal Eye Hospital	59	...
	Little Sisters of the Poor (Plymouth Grove)	182	26
	Casual Wards (All Saints)	21	...
	Southern Hospital	23	18
	Cancer Hospital	19	14
	Maternity Home	11	11
	Home for Young Girls	18	...
	Rylands' Orphanage	17	...
	Church Army Labour Home	20	...
	Penitentiary	51	...
HULME	Cavalry Barracks	404	1
	Boys' Home (Chester Road)	20	...
	Loretto Convent	...	...
* OUTSIDE CITY.	Withington Workhouse	1,375	662
	Pendlebury Hospital	50	47
	Prestwich Lunatic Asylum	755	41
	St. Anne's Home, Dunham Massey	...	6
	Wigan Infirmary	...	1
	Styal Home (Chorlton Union)	...	1
	Cheadle Asylum	...	1
TOTALS		9,296	2,569

* Proportion only.

The general results mentioned are given in detail in Table F and G, which show for a number of years the total death-rate from certain specific diseases and from the main causes of death. In Table L the death-rates are given in more detail for the year 1899. Table J accounts for the births, whether, legitimate or illegitimate; and Table O accounts for the deaths, whether certified by a registered medical practitioner, certified by the Coroner, or uncertified.

From Table F we observe that the death-rate was higher in 1899 from measles than in any year since, and not excepting, 1887. This disease has now assumed a serious epidemic form.

From summer diarrhœa the death-rate is higher than in any year since 1872.

In regard to scarlet fever, diphtheria, whooping cough, and enteric fever, the death-rate is below the average.

From Table G we perceive that, though in regard of tubercular disease 1899 shows a slight loss as compared with 1898, while the same is true in respect of diseases of the nervous system and of the circulation, there is a great increase in the number of deaths from diseases of the respiratory system. That this increase is temporary, and due probably to influenza, is shown by the improvement manifest under diseases of the digestive system and diseases of the urinary system.

From Tables F and L we find that the death-rate from cancer has undergone a further increase in 1899, and stands at 0·75 per 1000 as compared with an average of 0·66 in the previous 8 years. The gradual increase in mortality from this formidable class of illness is a serious fact, which is engaging much attention. There can now be very little doubt that it is a real increase that is taking place.

MORTALITY AT DIFFERENT AGES.

The facts which we have already considered have prepared us for what we may expect as to the incidence of the death-rate at different age-groups.

There will be a high infant mortality owing to the excessive mortality from diarrhœa and measles, and there will be a high adult mortality owing to the excessive number of deaths from influenza, pneumonia, and heart disease.

If we refer to Table 4 (page 10), which compares the mortality of 1899 at different groups of ages with that prevailing in the preceding eight years, we find that it realises these impressions.

At ages 0–5 there is a distinct excess of mortality in 1899.

At ages 5–10 a slight diminution.

At ages 10–15 a still slighter excess.

At 15–20 an excess which is not yet marked.

At all higher ages an excess increasing with advancing years, except at ages 85 and upwards.

As compared with England and Wales, there is the usual excessive mortality at ages 0–5, the diminished mortality at ages 5–25, and the excessive mortality at ages above 25.

Between males and females there is very little difference as regards the increase of mortality, boys remaining exempt from the higher mortality in 1899 to a somewhat higher age than girls.

In the Annual Report for 1898, attention was called to the fact that at school age that year showed a marked improvement on other recent years. The figures given in Table 4 show that this improvement continues into 1899. This is undoubtedly due to the lesser prevalence of zymotic disease in general.

As usual, the death-rate of females is considerably less than the death-rate of males, except at the ages 5–15.

Referring now to Table J, we find that the percentage of illegitimate births is 4·13, which is a slight increase on the figures for 1898. The death-rate of illegitimate children is much more than double that of legitimate children.

If we refer to Table E we find that the loss of life is much the greatest in the first three months, and that the special conditions under which death then occurs are classified as premature birth, atrophy and marasmus, lung diseases, convulsions, and diarrhœa.

Diarrhœa exacts its heaviest mortality in the next three months of life, at which age lung diseases continue to cut off large numbers.

Between the ages of 6 and 12 months, measles, whooping cough, diarrhœa, and lung disease cause a high mortality.

In the 2nd year of life, measles reaches its greatest severity, while large numbers die from lung diseases, diarrhœa, and whooping cough. In the 3rd year of life, many deaths are still caused by lung diseases and measles, while the mortality from whooping cough is rapidly diminishing.

TABLE 4.—ANNUAL RATES OF MORTALITY IN MANCHESTER IN THE YEAR 1899 AT TWELVE GROUPS OF AGES AMONGST PERSONS, MALES AND FEMALES, COMPARED WITH THE AVERAGE RATE AT THOSE AGES IN MANCHESTER 1891–1898, AND ENGLAND AND WALES DURING THE DECENNIUM 1881–90.

	PERSONS			MALES			FEMALES		
	Manchester Average, 1891–1898	Manchester, 1899	England and Wales, 1881–90	Manchester Average, 1891–1898	Manchester, 1899	England and Wales, 1881–90	Manchester Average, 1891–1898	Manchester, 1899	England and Wales, 1881–90
All Ages	22·91	23·89	19·17	24·15	25·46	20·28	20·77	22·44	18·06
0—	77·76	81·95	56·77	83·56	85·20	61·59	72·09	78·78	51·95
5—	5·17	4·99	5·31	4·91	4·88	5·35	5·41	5·10	5·27
10—	2·73	2·74	3·04	2·85	2·77	2·96	2·61	2·71	3·11
15—	4·22	4·33	4·38	4·68	4·70	4·33	3·79	3·98	4·42
20—	5·32	5·43	5·64	5·81	6·65	5·73	4·89	4·36	5·54
25—	8·28	8·51	7·20	8·85	8·92	7·78	7·75	8·14	7·41
35—	15·68	16·74	11·51	17·72	19·08	12·41	13·73	14·52	10·61
45—	25·64	27·82	17·23	30·17	32·70	19·36	21·59	23·47	15·09
55—	48·38	54·48	31·57	55·15	62·44	34·69	42·91	47·84	28·45
65—	93·83	102·05	65·38	106·93	116·43	70·39	84·83	92·19	60·36
75—	203·38	239·57	138·88	226·76	268·57	147·14	189·50	222·37	130·62
85—	296·71	290·75	288·32	319·68	347·22	305·81	285·89	264·52	270·82

In 1899 the largest contributions to the deaths at the 4th and 5th year of life are still furnished by measles and lung diseases.

Table M sums up the information contained in Table E, and extends it to later groups of ages. At ages under 5 the chief causes of death are lung disease, diarrhœa, measles, and tubercular disease.

At ages 5 to 15 tubercular disease takes the lead, though closely followed by lung disease, and furnishes nearly one-fourth of the entire death-rate at this age.

At 15 to 25 years of age, tubercular disease causes a mortality more than twice that arising from lung disease, which comes next in severity, and more than one-third of the total mortality at that period of life.

At the age period 25–45, tubercular disease still causes the highest death-rate; but the mortalities from diseases of the lungs and from heart disease are now increasing, while a considerable number already die from affections of the brain.

Not far off one-third of all deaths are due to tubercular disease.

At ages 45–65, tubercular disease is less prominent, although the actual mortality is higher than at earlier ages.

Diseases of the lungs now cause more than one-fourth of all deaths, while diseases of the heart and of the brain together are answerable for as many as lung disease.

Over 65 years of age it is chiefly from bronchitis, heart disease, and disease of the brain that the end arrives. It is probable at more advanced ages that many chest affections, which are regarded as cases of chronic bronchitis, are in reality tubercular in their nature, and that, with advancing age, the actual number of persons having active tuberculosis is greater than appears. But, apart from this, the figures which have been given, sufficiently attest the task which lies before us in attacking tuberculosis.

ON THE VITAL STATISTICS OF DIFFERENT PARTS OF THE CITY.

As the last Census recedes, the vital statistics of the various districts of the city become more and more uncertain, and though an approximate estimate of the population might be formed, it is now scarcely worth the while.

After the next Census, however, an effort will be made to maintain a fairly accurate estimate for each district year by year.

An estimate of the populations of the townships was made in 1897 on the basis of inhabited houses, and the result is given at page 5 of the Annual Report for that year.

At that time, the method of the Registrar-General appeared to give too small a population for these districts—Ancoats, Cheetham, Blackley, Harpurhey, Moston, Clayton, Ardwick, and Rusholme.

The population seemed to have increased, especially in Harpurhey, Moston, Clayton, and Ardwick, and there was direct evidence in the new houses that such was the case.

It appeared also from these figures that notable decreases had occurred in the Central and St. George's districts, in Crumpsall, Newton, Bradford, Openshaw, and Chorlton. Smaller decreases were shown for Hulme and West Gorton. In fact, for these districts the population was practically stationary.

The birth and death rates are thus over-estimated for some districts and under-estimated for others.

An accurate adjustment is scarce possible, but by reference to the altered birth and death rates as shown in the tables for that year we can keep ourselves from any great amount of miscalculation.

We see that the death-rates, as calculated by the Registrar-General's method, are unduly high in Clayton, Harpurhey, and Moston, especially in the first named, and that for the other districts enumerated they are higher to some extent than they should be.

In the same way, they are unduly low in the Central District, and in Openshaw and the other districts named to a less extent.

The same is true of the birth-rates.

As regards the larger divisions of the city, the death-rate in the Manchester Township on the Registrar's estimate is unduly low, in North Manchester unduly high, while in South Manchester it is not appreciably altered.

Bearing these corrections in mind, and referring to Table H, we find that the birth-rate is not materially different in the Manchester Township and in North Manchester, while it is considerably lower in South Manchester.

The death-rates are, however, widely different as shown by the same table, which gives a natural increase of 2·42 per 1000 for the Manchester Township 7·87 per 1000 for South Manchester, and 14·59 per 1000 for North Manchester—a remarkably large variation.

Any error which may exist in the statistics affects also the natural increase in the same proportion as it does the birth and death rates.

Taking this into account, we may affirm that a natural increase exceeding 10 per 1000 is taking place in Cheetham, and in a continuous area embracing Harpurhey, Moston, Newton, Bradford, Beswick, Ardwick, Openshaw, West Gorton, and Rusholme—roughly speaking, the industrial part of the city.

Referring to Table J, we see that illegitimacy is most conspicuous in the Central District, Chorlton-upon-Medlock, and Hulme, that is, in those portions of the city which do not contribute the largest proportion to the natural increase of the population.

The subject of these incidences has been previously discussed.

From Table 5, it appears that only in Cheetham and Crumpsall does the comparative mortality figure fall below that of England and Wales generally.

TABLE 5.—1899.—RECORDED AND CORRECTED DEATH-RATES PER 1000 PERSONS LIVING IN GROUPS OF CIVIL PARISHES.

Groups of Civil Parishes in the Sub-Districts of Manchester, arranged in order of their corrected Death-rates	* Standard Death-rate	† Factor for correction for Sex and Age Distribution	Recorded Death-rate, 1899	‡ Corrected Death-rate, 1899	§ Comparative Mortality Figure
Cheetham and Crumpsall	17·72	1·0807	15·06	16·10	878
Moston	17·72	1·0807	22·00	23·78	1,297
Ardwick, Openshaw, West Gorton, and Rusholme	16·81	1·1374	20·94	23·82	1,299
Newton Heath, Bradford, Beswick, and Kirkmanshulme ..	17·08	1·1211	21·35	23·93	1,306
Blackley and Harpurhey	17·16	1·1157	22·09	24·65	1,345
Chorlton-upon-Medlock.	16·29	1·1755	21·50	25·28	1,379
Hulme	16·93	1·1309	25·46	28·80	1,571
Clayton	17·71	1·0815	28·11	30·40	1,658
Central	16·25	1·1782	27·97	32·95	1,798
St. George's	16·89	1·1340	31·06	35·22	1,921
Ancoats	16·83	1·1381	32·22	36·67	2,001
England and Wales ...	19·15	1·0000	18·33	18·33	1,000

* The standard death-rate signifies the death-rate at all ages calculated on the hypothesis that the rates at each of twelve age periods in each town were the same as in England and Wales during the ten years 1881-90, the death-rate at all ages in England and Wales during that period having been 19·15 per 1000.

† The factor for correction $\left\{=\frac{19{\cdot}15}{\text{Standard death-rate}}\right\}$ is the figure by which the recorded death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The corrected death-rate is the recorded death-rate multiplied by the factor for correction.

§ The comparative mortality figure represents the corrected death-rate in each town compared with the recorded death-rate at all ages in England and Wales in 1899 taken as 1000.

TABLE 6.—1899.—DEATH-RATES* IN THE HOMES OF THE PEOPLE, IN WORKHOUSES, AND IN HOSPITALS FOR THE VARIOUS DIVISIONS OF THE CITY.

	STATISTICAL DIVISIONS	Estimated Populations	Death-rate per 1000 of persons dying in their own homes	Death-rate per 1000 of persons dying in Workhouses	Death-rate per 1000 of persons dying in Hospitals	Total death-rate per 1000
	City of Manchester ...	‡ 546,010	19·18	3·19	1·52	23·89
I.	Manchester Township	144,665	21.97	6·42	2·27	30·66
II.	Northern Districts ...	147,846	17.99	0·96	1·18	20·14
III.	Southern Districts ...	253,499	18·30	2·64	1·28	22·22
	Ancoats	45,219	24·72	4·89	2·61	32·22
I.	Central	35,467	17·42	7·89	2·65	27·97
	St. George's	63,979	22·54	6·69	1·83	31·06
	Cheetham	31,688	13·57	0·69	1·39	15·65
	Crumpsall	10,282	11·67	0·88	0·68	13·23
	Blackley	8,297	16·03	1·33	2·05	19·40
	Harpurhey	13,205	21·81	1·21	0·76	23·78
II.	Moston	7,091	20·31	0·71	0·99	22·00
	Newton Heath	37,974	18·64	0·87	1·05	20·57
	Bradford	23,772	21·71	1·30	1·26	24·27
	Beswick	11,161	18·64	1·16	1·07	20·88
	Clayton	4,376	25·82	0·46	1·83	28·11
	Ardwick	38,143	19·95	2·23	1·68	23·86
	Openshaw	33,143	16·08	1·15	0·91	18·13
III.	West Gorton	28,570	19·74	1·47	0·77	21·98
	Rusholme and Kirk.	20,160	15·43	0·64	0·84	16·91
	Chorlton-on-Medlock	62,086	16·57	3·62	1·30	21·50
	Hulme	71,397	20·18	3·74	1·54	25·46

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* In this table, *every death* occurring in a Public Institution has been referred to the District from which the patient originally came.

‡ Population estimated to middle of 1899.

Referring now to Table 6 (opposite), we find that the usual relationship exists between the total death-rates in the different divisions of the city, North Manchester having the lowest and the Manchester Township much the highest death-rate. Still, the death-rate of North Manchester is considerably too high, and the death-rate of the Manchester Township considerably too low. That is to say, if the figures were corrected, the differences would be intensified.

Of the sub-divisions, Ancoats, Central, and St. George's have the highest death-rates, and, when corrected, these would be almost the same.

Of the other districts, Hulme, at a long interval, has the highest death-rate.

The Clayton mortality is too wide of the mark to be reckoned.

After Hulme comes Bradford.

Then Ardwick, Harpurhey, and Moston. But in these three the death-rates are unduly high.

Then comes West Gorton, in which the mortality is too low.

Probably, after Bradford, the corrected mortality is highest in West Gorton.

The death-rate occurring in the workhouse being taken as an index of poverty, we see that by far the poorest class are to be found in the Manchester Township, and especially in the Central and St. George's districts.

But we also perceive that Hulme and Chorlton-upon-Medlock are not so very far behind Ancoats.

Then in 1899 comes Ardwick, then West Gorton.

The proportion of persons dying in public institutions other than the union infirmaries is also an interesting study. Strictly speaking, in forming an idea of total pinch, these two sets of figures should be taken together. But they are not additive.

We have seen in former reports that the death-rates of persons dying in their own homes is on the whole a better index to sanitary conditions than the total death-rates.

Making, as before, proper allowances for the populations, we perceive that these conditions are indicated as being worst in Ancoats, St. George's, Bradford, Hulme, and West Gorton.

TABLE 7.—Average Annual Rates of Mortality from certain Compared

Statistical Divisions		Scarlet Fever		Enteric Fever		Phthisis	
		1891–8	1899	1891–8	1899	1891–8	1899
City of Manchester		**0·25**	**0·08**	**0·23**	**0·13**	**2·06**	**2·05**
I.	Manchester Township	0·28	0·08	0·24	0·15	3·10	3·09
II.	North Manchester	0·26	0·09	0·22	0·11	1·30	1·34
III.	South Manchester	0·24	0·09	0·23	0·14	1·85	1·86
I.	Ancoats	0·27	0·02	0·24	0·18	2·63	2·83
	Central	0·30	0·03	0·32	0·14	3·47	2·85
	St. George's	0·28	0·14	0·20	0·13	3·23	3·41
II.	Cheetham	0·18	0·13	0·13	0·13	1·23	1·10
	Crumpsall	0·17	...	0·11	0·19	0·97	0·78
	Blackley	0·19	...	0·19	0·12	1·17	2·05
	Harpurhey	0·29	0·08	0·21	0·23	1·14	1·51
	Moston	0·27	...	0·27	...	1·06	1·41
	Newton	0·29	0·08	0·27	0·03	1·53	1·63
	Bradford	0·31	0·13	0·27	0·21	1·35	1·18
	Beswick	0·35	0·18	0·25	...	1·25	0·90
	Clayton	0·23	...	0·16	0·23	1·18	2·06
III.	Ardwick	0·30	0·10	0·21	0·24	1·71	1·76
	Openshaw	0·21	0·12	0·28	0·12	1·11	1·18
	West Gorton	0·24	0·14	0·30	0·18	1·67	1·72
	Rusholme and Kirk.	0·15	...	0·17	0·05	1·11	1·04
	Chorlton-upon-Medlock	0·20	0·05	0·16	0·10	2·04	1·90
	Hulme	0·27	0·10	0·26	0·14	2·32	2·48

CAUSES IN DIVISIONS AND DISTRICTS, FOR THE 8 YEARS 1891–8 WITH 1899.

Nervous Diseases other than Convulsions		Circulatory System		Bronchitis		Pneumonia		Other Respiratory Diseases	
1891–8	1899	1891–8	1899	1891–8	1899	1891–8	1899	1891–8	1899
1·73	1·66	1·77	2·00	2·43	2·36	2·40	2·81	0·38	0·30
1·86	1·93	2·23	2·40	3·29	3·35	3·29	4·02	0·46	0·24
1·64	1·53	1·42	1·31	1·88	1·74	1·95	2·26	0·33	0·36
1·69	1·59	1·70	2·17	2·22	2·17	2·10	2·45	0·37	0·29
2·00	2·01	2·10	1·95	4·05	3·76	3·44	3·91	0·52	0·27
1·93	1·86	2·38	2·59	3·03	3·16	3·05	4·09	0·40	0·17
1·73	1·91	2·24	2·61	2·89	3·16	3·32	4·05	0·44	0·27
1·56	1·52	1·35	1·17	1·33	0·88	1·28	1·61	0·26	0·16
1·50	1·17	1·31	1·17	1·10	1·56	1·04	0·78	0·21	...
2·09	1·45	1·90	2·65	1·75	1·45	1·80	2·05	0·68	0·48
1·50	1·14	1·62	1·51	1·54	1·44	2·26	3·03	0·41	0·76
1·60	2·82	1·66	1·69	1·23	1·97	1·60	2·40	0·25	0·56
1·82	1·42	1·54	1·24	1·97	1·55	2·08	2·63	0·32	0·40
1·50	1·68	1·08	0·97	2·94	2·73	2·58	2·19	0·36	0·29
1·55	1·61	1·38	1·16	2·12	2·42	2·68	3·14	0·29	0·27
1·41	1·60	1·08	1·83	2·52	3·88	2·62	3·20	0·29	1·14
1·46	1·49	1·53	2·04	2·32	2·07	2·12	2·73	0·38	0·29
1·32	0·94	1·46	1·99	2·12	1·99	2·06	1·66	0·35	0·21
1·43	1·51	1·26	1·58	1·87	1·75	2·36	2·84	0·28	0·04
1·32	1·19	1·55	1·74	1·33	1·44	1·15	1·34	0·25	0·55
1·80	1·69	1·78	2·61	2·11	2·03	1·90	2·29	0·41	0·26
2·05	2·00	2·00	2·28	2·65	2·79	2·44	2·97	0·41	0·39

Table L furnishes a comparison for the three main divisions of the city of the death-rates from certain diseases and groups of disease.

As usual, we find that there is a great predominance in the death-rates of the Manchester Township from diarrhœa, phthisis, other forms of chest disease, brain, and heart diseases.

In 1899 there is also an excess from measles, influenza, cancer, premature birth, and diseases of the digestive and urinary organs.

With regard to cancer, this has also been the case in 1897 and 1898.

South Manchester, as usual, has a higher death-rate than the other divisions from tabes mesenterica, although in 1899 there is but little difference between the three.

From most causes the death-rate is higher than in North Manchester, and it is noteworthy that the death-rate from cancer in the Manchester Township and in South Manchester is steadily higher than in North Manchester.

From diphtheria, however, North Manchester has, as usual, the highest death-rate, while in 1899 it has a higher death-rate than South Manchester from measles and diarrhœa.

Table 7 (pages 16 and 17), enables us to pursue the comparison for a few groups of diseases into the districts of which the main divisions are composed. With the same reservations as before, we find from this table.

1st.—Scarlet fever was prevalent in at least two areas in 1899—viz., St. George's, Cheetham, and Bradford; Beswick, West Gorton, and Openshaw. The mortality from this disease reached its lowest point last year.

2nd.—Enteric fever was more prevalent in the Central Districts and in South Manchester than in North Manchester. In no district of North Manchester was it very prevalent except in Bradford and Harpurhey. In South Manchester it affected chiefly Ardwick and West Gorton, to a less extent Hulme.

3rd.—Phthisis, as usual, showed an excessive incidence in all the districts in the Manchester Township. After these it bore most heavily on Hulme and Blackley. The numerous insanitary conditions in Hulme account for the exceptional incidence on that district, especially the crowding of houses on area.

4th.—Nervous diseases, &c. This cannot easily be dissociated from the subsequent large classes of heart and lung diseases. From each group, North Manchester suffers least and the Manchester Township most heavily, the correct differences being greater than these figures display.

When we pursue these diseases into the sub-districts it becomes somewhat difficult, especially having regard to the uncertainty of the populations to draw positive conclusions from the figures. Generally speaking, however, the death-rates from these causes agree with the view of the districts that we obtain from a consideration of the total death-rates.

We may now compare briefly the mortality rates in the different divisions of the city as shown in Table N.

We observe that at all ages the Manchester Township has the highest death-rate and North Manchester the lowest, but that the disparity between North and South Manchester only becomes very marked after the age period 25–45 years.

As already explained, however, these disparities would be increased if the populations were accurately ascertained.

The steep descent in mortality from the Manchester Township to South Manchester, and from South Manchester to North Manchester, in tubercular diseases is a very marked fact.

The same graduation is observable in heart disease, lung disease, and diseases of the digestive system.

From brain disease, North Manchester suffers by far the least at all ages.

INFECTIOUS DISEASES.

The diseases included in the Manchester Notification Act of 1881 are as follows: Smallpox, Scarlet Fever, Diphtheria, Typhus Fever, Enteric or Typhoid Fever, Relapsing Fever, Puerperal Fever, and Asiatic Cholera. Membranous Croup was added in 1892. The following cases were notified in 1899 and in the eight previous years, and the year 1899 is compared with the average of the previous eight years :—

	1891	1892	1893	1894	1895	1896	1897	1898	Aver'ge for 8 Years	1899
Smallpox	2	118	607	282	51	1	...	...	133	2
Scarlet Fever ...	1,138	1,671	2,031	2,230	2,302	2,389	1,790	897	1,806	1,467
Diphtheria ...... Memb. Croup	456	497	622	512	402	239	150	196	374	248
Typhus Fever ...	16	6	1	...	...	1	2	...	3	3
Enteric Fever ...	761	610	618	460	493	513	503	642	575	381
Relapsing Fever	4	...	...	...	...	...	...	...	1	...
Puerperal Fever	55	92	93	51	33	25	49	44	55	35
	2,432	2,994	3,972	3,535	3,281	3,168	2,494	1,779	2,957	2,136

The number of deaths for nine years from the more common diseases is shown in the following table, 1899 being compared with the average :—

From	1891	1892	1893	1894	1895	1896	1897	1898	Aver'ge for 8 Years	1899
Measles	220	369	293	222	505	567	628	271	384	699
Scarlet Fever ...	114	139	140	116	173	198	124	65	134	46
Diphtheria	122	91	122	102	72	54	29	41	79	71
Memb. Croup ...	6	39	60	47	41	29	17	10	31	14
Enteric Fever ...	189	124	127	91	95	118	95	120	120	73
Smallpox	...	2	49	21	2	...	...	...	9	...
Influenza	347	140	120	45	194	53	107	64	134	219
Whooping Cough	518	368	240	286	250	359	299	170	311	227
	1,516	1,272	1,151	930	1,332	1,378	1,299	741	1,202	1,349

From these tables it appears that, as regards scarlet fever, 1899 marked the rise of a fresh wave of that disease, although the number of deaths was unprecedentedly small.

Diphtheria, however, shows a marked increase both as regards the number of cases reported and as regards the number of deaths. Indeed the number of deaths from diphtheria considerably exceeded the number from scarlet fever, a relation which has not existed since 1891.

This disease appears to be on the increase.

Typhus fever put in an appearance in 1899. Fortunately, this was all. The disease was promptly recognised and dealt with. It appeared to take its rise somewhere about the docks.

From enteric fever not only was the number of cases notified considerably the smallest on record, but the number of deaths was also much smaller than in any previous year.

Two cases of smallpox occurred.

The number of notified cases of puerperal fever was smaller than in any previous year except in 1895 and 1896, but the significance of this is as yet uncertain.

Influenza exhibited a marked increase.

From measles the mortality was unprecedentedly high.

From whooping cough there were fewer deaths than in any previous year.

SMALLPOX.

Two cases of smallpox occurred last year, one of whom was a Jewess, infected probably in Russia. The other case was removed from the Withington Union during my absence, and would appear to have been somewhat doubtful. At all events, this patient had been four years inside the building and no source of infection was discovered.

During the present year (1900) smallpox has made its appearance in a large number of towns, and the outlook is not very cheerful for the coming winter.

The two protections which we possess against an outbreak of this disfiguring malady are vaccination and prompt action on the part of the Sanitary Authority. With regard to vaccination, it must be admitted that we are now in a very different position from that which we occupied ten years ago; and that on the next occasion when smallpox becomes epidemic the mortality is likely in this country to be general and high.

The percentage of infants escaping vaccination throughout England and Wales had risen from 3·8 in 1875 to 22·3 in 1896, and it was getting high time that some effective step should be taken which might arrest the decline of vaccination.

The Vaccination Act of 1898 appears to your Medical Officer of Health a well-conceived measure, and has proved most beneficial in its result. Indeed, it always appeared to him that it would lead to improvement in the number of infants vaccinated.

The clauses offering an improved calf lymph, and providing for a domiciliary visit on the part of the public vaccinator if parents have failed to get their children vaccinated, are calculated to remove a mass of prejudice.

On the other hand, the advance of the period within which vaccination must be performed from three to six months has had the effect of withdrawing from the attention of the vaccination officers a certain number of infants in the poorer and more shifting parts of our population.

This effect must, however, have been slight, judging from the figures, and it is probable that the falling off in the number of vaccinations which took place at first in Manchester was due merely to the slight delay in the operation of the Act. It did not extend beyond the first quarter of 1899.

Mr. Macdonald has kindly furnished me with the numbers of successful primary vaccinations performed by public vaccinators in 1898, 1899, and 1900 in quarters. These are:—

	1898	1899	1900
1st quarter	345	165	464
2nd ,, ...	315	378	485
3rd ,, ...	269	395	...
4th ,, ...	174	324	...

From the first quarter of 1899 onward there has been a great increase as compared with previous years. We may, I think, assume that the Act has been as successful in the Manchester Union as throughout the country generally. Nevertheless, during recent years, previous to the passing of the Act, there has been a great increase in the number of unvaccinated persons, and the consequences are likely to be serious. The mere fact that smallpox has appeared in so many districts as it has of late, and has yet failed to make any headway, shows that there is a second line of defence which is also strong. This consists of the public health service and the medical attendants of the people.

It says a good deal for medical education that medical men are able to recognise so promptly slight modified attacks of smallpox, when there is so little opportunity of seeing the disease.

The chief steps in the administrative protection of the community as carried out in Manchester may be thus stated ;

When smallpox threatens to become prevalent, bills are issued giving brief directions as to what classes of illness should be regarded as suspicious, and giving directions in regard to vaccination.

The medical students receive clinical demonstrations as an opportunity occurs.

The sanitary inspectors are furnished with a brief account of the disease which they are required to study, and which is considered sufficient to enable them to pursue their inquiries with intelligence.

On the notification of a case, the Medical Officer of Health or a deputy well acquainted with smallpox calls and sees the case, after which an order is issued for removal. He also gives directions as regards the persons to be re-vaccinated, and makes inquiries as to the origin of the case, &c.

The sanitary inspector then calls and records all available particulars, and makes arrangements for the removal of the patient to hospital.

If the Medical Officer of Health has failed to complete the information considered requisite, the sanitary inspector acting under his instructions makes the necessary inquiries and arrangements for vaccination and disinfection.

Quarantine of " contacts " is not considered necessary.

All exposed persons having been properly vaccinated, school children are required to cease attending school for a fortnight from the date of removal of the patient to hospital.

With regard to workers in general who have been exposed to infection, the following rule is substituted :—

Their personal clothing having been disinfected and the person cleansed, supposing them to have been exposed to infection, unless successfully re-vaccinated, say, from June 2nd to 4th, they are required to absent themselves from work from June 2nd + 12th = that is, June 14th, to June 4th + 14th, that is, June 18th, both dates inclusive.

On arrival at hospital the patient is at once bathed, and thereafter the whole body is covered with carbolic oil 2·5 per cent. This procedure is repeated every day during the acute stage of the illness, as it is believed that in this way the aërial transmission of infection can be prevented.

SCARLET FEVER.

It has already been mentioned that the long wave of scarlet fever has again begun to ascend. January, 1899, witnessed the lowest point, but a marked increase occurred in autumn. As is usually the case, the fatality did not correspond with the increasing numbers, and the number of deaths in 1899 was lower even than in 1898. The increase was general, but was particularly noticeable in two separate centres, as is made very clear by the following tables, which show the course of the disease week by week; exhibit a comparison with 12 other notification towns by which it is seen that the attack rate per 1000 was about half the average prevailing in those towns; and permit a view of the incidence of the disease on the different sanitary districts into which the city is divided, and of the proportion of removals to the hospital. It will be noted that the percentage of removals was somewhat higher than in 1898.

SCARLET FEVER. ATTACKS IN WEEKS ACCORDING TO DATE OF RASH.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 7	12	April 8	7	July 8	17	Oct. 7	48
,, 14	17	,, 15	15	,, 15	30	,, 14	55
,, 21	15	,, 22	17	,, 22	23	,, 21	56
,, 28	16	,, 29	20	,, 29	21	,, 28	38
Feb. 4	16	May 6	14	Aug. 5	23	Nov. 4	43
,, 11	14	,, 13	22	,, 12	20	,, 11	41
,, 18	11	,, 20	18	,, 19	26	,, 18	54
,, 25	18	,, 27	19	,, 26	24	,, 25	69
Mch. 4	11	June 3	23	Sept. 2	40	Dec. 2	67
,, 11	7	,, 10	16	,, 9	30	,, 9	65
,, 18	10	,, 17	28	,, 16	44	,, 16	47
,, 25	6	,, 24	26	,, 23	49	,, 23	49
April 1	5	July 1	24	,, 30	47	,, 30	34
Total...	158	Total...	249	Total...	394	Total...	666

City Total, 1467.

SCARLET FEVER ATTACKS.—RATES PER 1,000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1894	1895	1896	1897	1898	Mean	1899
Twelve Notification Towns*...	4·23	3·40	4·77	3·87	3·51	3·96	5·10
City of Manchester	4·27	4·37	4·42	3·34	1·66	3·61	2·69
Manchester Township	3·77	4·23	3·48	3·58	1·16	3·24	2·27
North Manchester	5·02	4·24	4·25	3·67	1·77	3·79	4·07
South Manchester	4·16	4·52	5·08	3·01	1·88	3·73	2·12

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* These are Blackburn, Bolton, Bradford, Burnley, Huddersfield, Hull, Leeds, Liverpool, Oldham, Preston, Salford, and Sheffield.

SCARLET FEVER ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	82	1·81	2·4	92·7
Central	113	3·19	0·9	90·3
St. George's	134	2·09	6·0	81·3
Cheetham	185	5·84	2·2	73·5
Crumpsall	23	2·24	...	78·3
Blackley	28	3·37	...	64·3
Harpurhey	105	7·95	1·0	79·1
Moston	78	11·00	...	61·5
Newton Heath.........	95	2·50	3·2	70·6
Bradford	32	1·35	6·2	78·1
Beswick	37	3·32	8·1	91·9
Clayton	18	4·11	...	61·1
Ardwick	102	2·67	4·9	74·6
Openshaw..............	54	1·63	7·4	59·2
Gorton (West)	52	1·82	1·9	73·1
Rusholme and Kirk.	115	5·70	...	52·2
Chorlton-on-Medlock.	103	1·66	3·9	70·0
Hulme	111	1·55	5·4	78·4
City of Manchester	**1467**	**2·69**	**3·0**	**74·4**

† Corrected: the fatal cases are those actually occurring amongst the cases notified.

SCARLET FEVER.

Number of attacks, of deaths, and case fatality per cent. at different ages :—

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year	11	1	9·1
1 to 2 years	37	5	13·5
2 to 3 ,,	93	8	8·6
3 to 4 ,,	143	12	8·4
4 to 5 ,,	168	4	2·4
5 to 6 ,,	134	1	0·7
6 to 7 ,,	126	3	2·4
7 to 8 ,,	129	2	1·6
8 to 9 ,,	109	1	0·9
9 to 10 ,,	81	1	1·2
10 to 15 ,,	273	4	1·5
15 to 20 ,,	74	1	1·4
20 to 25 ,,	48	...	...
25 to 35 ,,	34	1	2·9
35 to 45 ,,	7	...	...
Over 45 ,,	...	...	...
All ages	1467	44	3·0

SCARLET FEVER, 1891–1899.

Number of attacks, of deaths, and case fatality per cent. at different ages :—

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year	225	49	21·8
1 to 2 years	682	136	19·9
2 to 3 ,,	1,275	193	15·1
3 to 4 ,,	1,661	213	12·8
4 to 5 ,,	1,746	151	8·6
5 to 6 ,,	1,679	100	6·0
6 to 7 ,,	1,473	71	4·8
7 to 8 ,,	1,326	47	3·5
8 to 9 ,,	1,058	26	2·5
9 to 10 ,,	839	21	2·5
10 to 15 ,,	2,434	46	1·9
15 to 20 ,,	765	23	3·0
20 to 25 ,,	362	10	2·8
25 to 35 ,,	284	6	2·1
35 to 45 ,,	79	3	3·8
Over 45 ,,	27	1	3·7
All ages	15,915	1,096	6·9

Scarlet Fever Mortality.—Rate per 1000 living, compared with mean of five years.

	1894	1895	1896	1897	1898	Mean	1899
England and Wales............	0·17	0·15	0·18	0·15	0·11	**0·15**	0·12
33 Great Towns	0·21	0·18	0·22	0·18	0·14	**0·19**	0·13
London...........................	0·22	0·19	0·21	0·18	0·13	**0·19**	0·09
Manchester City............	0·22	0·33	0·37	0·23	0·12	**0·25**	0·08
Manchester Township	0·26	0·37	0·41	0·27	0·11	**0·28**	0·08
North Manchester	0·18	0·24	0·24	0·29	0·12	**0·21**	0·09
South Manchester	0·22	0·35	0·41	0·17	0·12	**0·25**	0·09
67 Smaller Towns	0·16	0·16	0·20	0·15	0·10	**0·15**	0·12
Rural Districts..................	0·14	0·12	0·14	0·12	0·09	**0·12**	0·10

The case fatality per cent. at different ages is shown by a table, which now comprises the results of nine years.

It will be seen that the fatality is greatest in the first year of life, and steadily diminishes up to the ages 10–15, after which it undergoes a slight ascent. The importance of defending very young children from an attack of scarlet fever is brought out very prominently.

The comparatively low death-rate shown in the next table is matter for congratulation.

Several important considerations arise in connection with scarlet fever.

In previous Annual Reports, reasons have been given for strongly suspecting that scarlet fever is connected with pollution of the soil, at all events by excremental matters. The pathology of the disease, the form of the annual curve of attacks, and the clinical facts indicating that the kidneys play an important part in the excretion of the infectious matter of the disease, all point in the same direction.

Special attention has, therefore, been bestowed on the closets attached to houses in which untraced cases of scarlet fever, or cases in which the source of infection surmised could only be accepted with hesitation, The result is embodied in the following figures for 1899 :—

CASES NOT TRACED.

Pail Adjoins			Pail within Four Feet			Pail Four Feet and Over		
Guide not defective	Guide defective	Otherwise defective	Guide not defective	Guide defective	Otherwise defective	Guide not defective	Guide defective	Otherwise defective
282	11	21	23	1	2	220	12	22

Midden			
Adjoins	Within 6 feet	Six feet and over	Water-closets
44	41	106	252

DOUBTFULLY-TRACED CASES.

Pail Adjoins			Pail within Four Feet			Pail Four Feet and Over		
Guide not defective	Guide defective	Otherwise defective	Guide not defective	Guide defective	Otherwise defective	Guide not defective	Guide defective	Otherwise defective
29	1	0	1	0	0	39	0	0

Midden			
Adjoins	Within 6 feet	Six feet and over	Water-closets
1	1	10	34

The preponderance of houses in which the pail adjoins the house is very marked, more so than usual, though it stands out quite clearly in all the annual statements. With this exception, however, it cannot be said that the figures go to prove that infection of the soil which we otherwise consider probable.

The figures are in agreement for scarlet fever and enteric fever, and, unless the pails adjoining the houses are actually in a majority, which we may assume not to be the case, show that the danger increases with the proximity of the pails to the house. But a direct enumeration of the positions of this class of closet is much to be desired.

RETURN CASES.

LIST OF PATIENTS DISCHARGED FROM CONVALESCENT WARDS.

Prog. No. of second case	Date of Eruption of second case.	Prog. No. of first case.	Date of Notification of first case.	Date of Eruption of first case.	Date of removal to Hospital.	Date of return home.	Interval between return and eruption in second case.	No. of days in Hospital, first case.	Contracted at		Complications of first case during stays in Hospital.	Condition of first case when discharged as stated by the relatives.
									Home.	Another House.		
229	Apl. 27	878	Dec. 2	Dec. 2	Dec. 2	Mar. 10	49	99	†		Albuminuria, Rhinitis	?
267	May 13	98	Feb. 14	Feb. 13	Feb. 14	May 9	5	54	†		Rhinitis	Nasal discharge
503	July 23	209	Apl. 24	Apl. 21	Apl. 24	July 18	6	55		†	Album. Otitis (2), Aden. Rhin.	None observed
510	July 22	232	May 3	May 1	May 3	July 18	5	77		†	Hæmorr.Nephritis,Rhinitis	None observed
520	July 30	248	May 9	May 7	May 9	July 21	10	74	†		Albuminuria, Rhinitis	?
527	Aug. 1	238	May 5	May 3	May 5	July 28	5	85	†		Otitis (2). Rhinitis	Discharge from nose and ears
532	Aug. 3	282	May 20	May 18	May 20	July 21	14	63	†		Bronchitis. Albuminuria	None observed
646	Sept. 2	248	May 9	May 7	May 9	July 21	44	74	†		Albuminuria, Rhinitis	?
706	Sept. 15	324	June 3	May 30	June 3	Aug. 15	32	74	†		Rhinitis	Discharge from nose and ears
*707	Sept. 15	421	July 1	June 30	July 1	Aug. 29	18	60	†		Nil	?
*740	Sept. 18	405	June 27	June 24	June 27	Sept. 5	14	71	†		Nil	None observed
*871	Oct. 9	531	Aug. 4	Aug. 1	Aug. 5	Sept. 29	11	56	†		Rhinitis	Sore nose
1166	Nov. 21	653	Sept. 5	Sept. 5	Sept. 5	Nov. 3	19	60	†		Rhinitis, Rheumatism	?
1231	Nov. 27	657	Sept. 5	Sept. 3	Sept. 5	Nov. 18	10	75	†		Rhin.Glossitis, Ulc.Stomat.	None observed
1235	Nov. 26	730	Sept. 18	Sept. 17	Sept. 18	Nov. 17	10	61		†	Adenitis (slight)	?
1243	Nov. 28	753	Sept. 22	Sept. 14	Sept. 22	Nov. 21	8	61		†	Adenitis (slight)	Sore nose
1265	Dec. 2	839	Oct. 5	Oct. 4	Oct. 5	Nov. 24	9	51	†		Otitis (L.) Adenitis	?
1363	Dec. 12	925	Oct 16	Oct. 16	Oct. 16	Dec. 5	8	51	†		Nil	None observed
1378	Dec. 14	901	Oct. 13	Oct. 13	Oct. 14	Dec. 5	10	53	†		Adenitis (slight)	Nasal discharge
1446	Dec. 22	992	Oct. 24	Oct. 24	Oct. 24	Dec. 15	8	53	†		Bronchitis	?
9	Jan. 1	890	Oct. 11	Oct. 10	Oct. 11	Dec. 29	4	80	†		Rhinitis	

RETURN CASES.

LIST OF PATIENTS DISCHARGED FROM ACUTE WARDS.

Prog. No. of second case.	Date of Eruption of second case.	Prog. No. of first case.	Date of Notification of first case.	Date of Eruption of first case.	Date of removal to Hospital.	Date of return home.	Interval between return and eruption in second case.	No. of days in Hospital, first case.	Contracted at		Complications of first case during stay in Hospital.	Condition of first case when discharged.
									Home.	Another House.		
177	Apl. 6	38	Jan. 19	Jan. 6	Jan. 19	Mar. 30	8	71		†	Rhinitis	?
193	Apl. 11	32	Jan. 16	Jan. 15	Jan. 16	Apl. 11	1	86	†		Hæm.Nepr.Otitis (2) Rhin.	None observed
213	Apl. 21	51	Jan. 23	Jan. 22	Jan. 23	Apl. 14	8	82		†	Hæm. Nephritis	None observed
225	Apl. 27	943	Dec. 30	Dec. 28	Dec. 30	Apl. 7	21	99	†		Otitis (L.) Adeni. Rhin. Album.	Discharge from nose and ears
*1012	Oct. 27	560	Aug. 14	Aug. 3	Aug. 14	Oct. 13	15	61	†		Nil	None observed
1063	Nov. 6	668	Sept. 6	Sept. 4	Sept. 6	Oct. 31	7	56	†		Nil	?
1225	Nov. 28	794	Sept. 28	Sept. 27	Sept. 27	Nov. 21	8	56	†		Nil	None observed
1412	Dec. 19	887	Oct. 11	Oct. 10	Oct. 11	Dec. 1	19	52	†		Nil	None observed
1454	Dec. 24	742	Sept. 20	Sept. 18	Sept. 20	Dec. 12	13	84	†		Diphtheria	None observed
22	Jan. 3	1049	Nov. 4	Nov. 3	Nov. 4	Dec. 19	16	46	†		Acute Tonsillitis, Varicocele	
85	Jan. 11	911	Oct. 14	Oct. 13	Oct. 14	Dec. 19	24	67	†		Albuminuria	

On "Return" Cases.

In a certain small percentage of cases, when a patient convalescent from scarlet fever has been discharged from the hospital, fresh cases arise in the household to which he has returned or amongst his playmates. These are called return cases.

In the Report for 1896, I formulated a theory in connection with the occurrence of these cases which may be briefly recapitulated. First, however, attention may be drawn to the importance of the subject.

The actual number of cases arising in connection with previous cases of scarlet fever discharged from Monsall Hospital was, in 1899, 31. Two of these cases were due to cases discharged in 1898, and three return cases in 1900 were due to cases discharged in 1899.

We thus get 32 return cases connected with 827 cases discharged in 1899 or 3·9 per cent.

Deducting 10 cases in which the period between discharge and the occurrence of the return cases exceeded 14 days, we get 22, giving 2·7 per cent.

Now two or three per cent. cannot be considered trifling, if we take into account the possibility of untraced cases being due to this cause.

To retrace the steps of the reasoning in connection with the origin of return cases, a careful inquiry was made in 1896 into the incidence of scarlet fever, following the release of cases isolated at home, and it was shown that subsequent cases do not follow at such late periods of the illness of the first case as we find in connection with the phenomenon of return cases, even where the conditions at home admit of such infection.

Therefore the phenomenon is a hospital one.

By a process of elimination one arrived at the conclusion that the one special phenomenon attaching to the hospital is the discharge of the cases direct from acute wards, and from contact with acute cases. Now, remembering the precautions adopted in hospital, this appeared possible only from the storage of infection from recent cases in the nostrils, in which, in the process of breathing, the germs will be accumulated. Possibly some storage may take place in other cavities. We know that such storage must occur. We know also the tenacity of life of the infective matter of scarlet fever, and it is almost self-evident that here is an explanation in the subsequent discharge of stored-up matter at home of the return cases

A course of action was accordingly chalked out.

A fortnight before discharge the patient was to be treated in a convalescent ward, being inuncted with a weak carbolic oil before transference, to prevent the ward being infected on arrival.

His nostrils, throat, and ears were to be washed out with a solution of permanganate of potash daily. He was to have a bath every other day, and thereafter to be again inuncted. Whenever possible he was to take exercise in the open air.

Whenever, and so long as, this procedure has been adopted, return cases of scarlet fever have practically ceased.

In the latter half of 1898, and in January, February, and part of March, 1899, these procedures were carried out, and only two return cases occurred during the nine months, which is within the limits of allowable error.

In March, 1899, however, Dr. Marsden, becoming apprehensive that contagion was liable to be conveyed by the syringe used, stopped the procedure, and the return cases recommenced.

The returns made in former reports seem to show that the occurrences of return cases have no necessary reference to complications such as rhinitis. Supposing that they have, the procedures adopted were successful in dealing with this persistent rhinitis.

Further, it has been put forward that the period of stay in the hospital is of importance. But a glance at the tables given in the Annual Reports dispels the idea.

Take, for instance, the number of days passed by the infective case in the hospital in any of the recent Annual Reports, and a perusal shows that the periods are unduly long, running to twelve, thirteen, and fourteen weeks. There is, in truth, nothing to be looked for in this direction.

Before resuming these observations, special precautions would have to be taken, and meantime the whole subject must be left incomplete. But the observations already made leave in my mind very little doubt as to the correctness of my conclusion or as to the results founded on it.

Supposing a slight degree of rhinitis to exist, probably very slight, on discharge, the process of accumulation of infective matters would of course be thereby augmented. But it will be seen from the list furnished by Dr. Marsden that in a number of cases no such discharge did exist.

Further, it has been found that on similar exposure an accumulation of tubercle bacilli takes place in the nostrils of exposed persons.

I have little doubt that if the nostrils of patients discharged from diphtheria wards were examined, diphtheria bacilli would be detected, occasionally at least, and no doubt that such would be the case when care had not been taken to remove diphtheritic discharges.

SCHOOL INVASION.

The features of the invasion of schools by scarlet fever is once more shown in the accompanying tables. We have already seen that in one or two schools the amount or intensity of infection has been such as to cause the school itself to become a persistent focus of disease. This occurrence so far has been very rare. In this respect scarlet fever is utterly different from measles and whooping cough, which find in school life their strongest aids to propagation.

Nor is the reason far to seek.

The onset of scarlet fever is in general sudden and severe. The disease is not highly, if at all, infectious until the symptoms have declared themselves. Generally the child is removed from school, and the danger of infection is averted. It is quite otherwise with measles and whooping cough, which are highly infectious before their characteristic features have disclosed themselves.

But although there is a low intensity of scarlatinal infection present in school, generally speaking, there is great persistency of infection once the disease has established itself, and it may go on for a year or more in one department, attacking a case in May, another in June, another in July, and so on.

Further, the disease does not spread readily from one department to another. It passes much more easily from girls to infants and *vice versa* than from either department to boys, or from boys to girls or infants, but that is because girls and infants usually have a common playground and common closets.

The history of scarlet fever in schools seems to imply a low power of aërial transmission.

It follows that closure of schools on account of scarlet fever is rarely necessary or advisable.

It should also be said that it does not follow, because scarlet fever has not attained any power of diffusion in schools to speak of, that it may not do so during the increased prevalence which is coming, in which case these statements might require modifying.

In the present year, at all events, in no one school was such a degree of diffusion present as to call urgently for closure of the school.

The complete facts relating to the propagation of Scarlet Fever in Schools are subjoined.

T. denotes infectious source traced outside school.
N. T. denotes infectious source not traced.

No. on School Register, 17 :—

Date of Eruption	Age	Sex	Department
Feb. 22 ...	11	m.	Boys T.
May 10 ...	5	m.	Infants N. T.
May 15 ...	8	f.	Girls T. (brother)
July 21 ...	7	f.	Girls N. T.
Oct. 3	12	f.	Girls N. T.
Oct. 6	10	m.	Boys N. T.
Oct. 8	6	m.	Infants N. T.
Oct. 9	6	m.	Infants N. T.
Oct. 15 ...	10	f.	Girls T. (sister)
Nov. 23 ...	5	f.	Infants T. (brother)
Nov. 23 ...	7	f.	Infants N. T.

There is slight diffusion amongst the infants in the third quarter of the year.

No. on School Register, 19 :—

Date of Eruption	Age	Sex	Department
Jan. 22 ...	6	f.	Infants N. T.
Feb. 5	9	m.	Boys T. (return)
May 13 ...	10	m.	Boys N. T.
May 30 ...	12	m.	Boys N. T.
June 18 ...	6	f.	Girls N.T.
June 26 ...	13	m.	Boys N. T.
July 4 ...	12	f.	Girls N. T.
July 4 ...	6	f.	Girls N. T.
July 9 ...	5	f.	Infants N. T.
July 13 ...	4	f.	Infants N. T.
Aug. 31 ...	10	m.	Boys N. T.
Oct. 18 ...	11	m.	Boys N. T.
Oct. 18 ...	7	f.	Girls N. T.
Oct. 24 ...	8	m.	Boys N. T.
Nov. 8 ...	10	f.	Girls N. T.
Nov. 7 ...	9	f.	Girls N. T.
Nov. 9 ...	6	f.	Infants N. T.
Nov. 12 ...	4	f.	Infants N. T.
Nov. 12 ...	8	f.	Girls N. T.
Nov. 18 ...	4	f.	Infants N. T.
Nov. 19 ...	9	f.	Girls N. T.
Nov. 21 ...	7	m.	Boys N. T.
Nov. 23 ...	7	f.	Girls N. T.
Nov. 24 ...	8	f.	Girls N. T.
Dec. 3 ...	6	m.	Infants T. (brother)
Dec. 8 ...	8	m.	Boys T. (brother)
Dec. 11 ...	11	f.	Girls N. T.

There is slight diffusion amongst the boys in the first half of the year, and again in the second half, but very slight intensity of infection.

The same is true of the girls' department as regards the first half of the year; but from October onwards a distinct, though not severe, invasion of this department occurs. A similar, if somewhat later, invasion of the infants' department is also manifest.

No. on School Register, 27 :—

Date of Eruption	Age	Sex	Department
Jan. 8......	11	m.	Boys N. T.
Jan. 9......	11	m.	Boys N. T.
Mar. 11 ...	11	m.	Boys N. T.
May 15 ...	11	m.	Boys N. T.
May 15 ...	6	f.	Infants N. T.
May 23 ...	6	m.	Infants N. T.
May 26 ...	6	f.	Infants N. T.
May 30 ...	6	f.	Infants N. T.
June 9... ..	8	f.	Girls N. T.
June 12 ...	8	f.	Girls N. T.
June 16 ...	10	f.	Girls N. T.
June 28 ...	9	m.	Boys N. T.
June 30 ...	12	f.	Girls N. T.
Aug. 20 ...	8	m.	Boys N. T.
Aug. 22 ...	7	m.	Boys N. T.
Aug. 28 ...	6	f.	Infants N. T.
Sept. 4 ...	4	f.	Infants N. T.
Sept. 24 ...	5	f.	Infants N. T.
Sept. 29 ...	9	f.	Girls N. T.
Sept. 29 ...	6	m.	Infants N. T.
Oct. 14 ...	8	f.	Girls N. T.
Nov. 2 ...	5	m.	Infants N. T.
Nov. 2 ...	8	f.	Girls N. T.
Nov. 25 ...	6	m.	Infants N. T.
Dec. 8 ...	7	m.	Boys T. (brother)
Dec. 13 ...	7	m.	Boys N. T.
Dec. 21 ...	6	f.	Infants N. T.
Dec. 25 ...	8	m.	Boys N. T.

At this school, the disease makes its appearance amongst the boys in January, and just manifests itself in March and May. In May it definitely attacks the infants' department, and in June the girls' department.

In the end of August it reappears in the infants' department, and maintains its hold till the end of the year.

In September, October, and November cases occur amongst the girls, and in December amongst the boys.

No. on School Register, 41 :—

Date of Eruption	Age	Sex	Department
May 25 ...	10	m.	Boys T.
May 24 ...	4	m.	Infants N. T.
July 4	9	m.	Boys N. T.
July 9	8	m.	Boys T.
July 15......	11	m.	Boys N. T.
July 24......	11	m.	Boys N. T.
July 24......	4	f.	Infants T. (brother)
July 31......	11	m.	Boys N. T.
Sept. 5......	11	f.	Girls N. T.
Nov. 22 ...	12	m.	Boys N. T.
Dec. 23 ...	13	m.	Boys T. (brother)

Here the boys' department is definitely, though not severely, invaded in July.

No. on School Register 47 :—

Date of Eruption	Age	Sex	Department
Jan. 7	7	f.	Girls, junr. N.T.
Sep. 15 ...	6	f.	Infants N.T.
Sep. 29 ...	7	f.	Infants N.T.
Oct. 17 ...	11	f.	Girls N.T.
Oct. 18 ...	14	f.	Pupil Teacher N.T.
Oct. 22 ...	9	f.	Girls T. (sister)
Nov. 19 ...	12	f.	Girls N.T.
Dec. 4 ...	8	f.	Girls T. (brother)
Dec. 7 ...	12	f.	Girls N.T.
Dec. 9 ...	8	f.	Girls N.T.
Dec. 10 ...	7	f.	Girls T. (sister)

Here the girls' department is clearly, though slightly, infected towards the end of the year.

No. on School Register, 59 :—

Date of Eruption	Age	Sex	Department
Jan. 12	6	m.	Infants N.T.
Jan. 18	8	m.	Mixed T. (brother)
Aug. 11	6	f.	Infants N.T.
Aug. 18	6	m.	Infants N.T.
Aug. 30	11	m.	Mixed T (brother)
Oct. 10	7	f.	Infants
Oct. 17	7	m.	Infants N.T.
Oct. 30	4	m.	Infants T. (sister)
Nov. 2	6	m.	Infants N.T.
Nov. 8	14	f.	Mixed N.T.
Nov. 27	15	m.	Mixed N.T.
Dec. 2	10	m.	Mixed N.T.

A slight diffusion takes place in the infants' department in October and the beginning of November, and a similar slight diffusion in the mixed department in November and the beginning of December.

No. on School Register, 65 :—

Date of Eruption	Age	Sex	Department
Jan. 17	6	f.	Infants N.T.
Jan. 25	8	m.	Mixed T. (sister)
April 13	8	f.	Mixed N.T.
April 21	8	m.	Mixed N.T.
June 14	9	m.	Mixed N.T.
June 30	9	m.	Mixed N.T.
July 16	5	f.	Infants N.T.
Sept. 14	6	m.	Infants T. (brother)
Oct. 6	6	f.	Infants N.T.
Oct. 7	3	f.	Infants T. (sister)
Nov. 16	9	m.	Mixed N.T.
Nov. 19	9	f.	Mixed N.T.

Here the mixed department appears to be slightly invaded in the first and second halves of the year.

No. on School Register, 75 :—

Date of Eruption	Age	Sex	Department
April 11	7	f.	Infants N. T.
April 14	9	m.	Mixed N. T.
April 21	7	f.	Infants T. (brother)
April 21	6	m.	Infants T. (brother)
April 25	7	f.	Infants N. T.
May 12	12	m.	Mixed N. T.
May 20	8	m.	Mixed N. T.
May 23	6	f.	Infants N. T.
May 26	7	f.	Infants N. T.
May 30	9	f.	Mixed N. T.
June 2	10	m.	Mixed N. T.
June 7	8	f.	Mixed N. T.
June 11	4	m.	Infants N. T.
June 12	4	f.	Infants N. T.
June 12	11	f.	Mixed N. T.
July 23	9	f.	Mixed T. (return)
Aug. 10	6	f.	Infants N. T.
Aug. 27	12	m.	Mixed N. T.
Sep. 14	4	f.	Infants N. T.
Sep. 16	6	m.	Mixed N. T.
Nov. 6	5	f.	Infants N. T.
Nov. 9	7	f.	Infants N. T.
Nov. 21	5	f.	Infants T. (sister)
Nov. 25	10	m.	Mixed T. (sister)
Nov. 28	6	f.	Infants N. T.
Dec. 1	7	m.	Boys N. T.
Dec. 12	6	f.	Infants N. T.

Here the infants' department is decidedly affected in April, May, and June, and again in November and December.

The mixed department is affected also in April, May, and June, though less markedly, and very slightly towards the end of the year.

No. on School Register, 97 :—

Date of Eruption	Age	Sex	Department
June 2 ...	3	m.	Infants T.
June 17 ...	6	m.	Infants N. T.
July 16 ...	12	f.	Mixed T.
Aug. 31 ...	4	m.	Infants N. T.
Sep. 11 ...	11	m.	Mixed N. T.
Sep. 15 ...	6	m.	Infants T. (brother)
Sep. 17 ...	12	f.	Mixed N. T.
Oct. 3 ...	11	f.	Mixed N. T.
Oct. 3 ...	8	f.	Mixed N. T.
Oct. 16 ...	8	m.	Mixed T. (sister)
Oct. 18 ...	11	f.	Mixed N. T.
Dec. 11 ...	10	f.	Mixed N. T.
Dec. 1 ...	12	m.	Mixed N. T.

There is distinct diffusion in the mixed department in October and December.

No. on School Register, 107 :—

Date of Eruption	Age	Sex	Department.
May 20 ...	7	m.	Infants N. T.
July 24 ...	6	f.	Infants N. T.
Sep. 3	7	f.	Girls N. T.
Sep. 5	10	f.	Girls N. T.
Sep. 10 ...	7	m.	Infants N. T.
Oct. 4	4	f.	Infants N. T.
Oct. 5 ...	6	m.	Infants N. T.
Oct. 5 ...	4	f.	Infants N. T.
Nov. 21...	6	m.	Infants T. (return)
Dec. 7 ...	7	m.	Infants T. (brother)
Dec. 18...	5	f.	Infants T. (brother)

There is slight diffusion in the infants' department in September and October.

No. on School Register, 127 :—

Date of Eruption	Age	Sex	Department
Jan. 21 ...	5	f.	Infants N. T.
Feb. 25 ...	6	m.	Infants N. T.
April 20 ...	4	f.	Infants N. T.
April 25 ...	7	f.	Girls N. T.
June 12 ...	5	f.	Infants N. T.
June 26 ...	4	f.	Infants N. T.
July 6	9	f.	Girls N. T.
July 12 ...	10	f.	Girls N. T.
July 18 ...	8	m.	Boys T.
July 20 ...	4	f.	Infants T.
Aug. 22 ...	8	f.	Girls N. T.
Aug. 25 ...	7	f.	Girls N. T.
Sep. 3	5	m.	Infants N. T.
Sep. 12 ...	10	m.	Boys N. T.
Sep. 21 ...	11	m.	Boys T. (brother)
Sep. 21 ...	8	m.	Boys N. T.
Sep. 22 ...	11	f.	Girls N. T.
Sep. 22 ...	5	f.	Infants N. T.
Sep. 25 ...	11	f.	Girls N. T.
Sep. 29 ...	6	m.	Infants N. T.
Sep. 29 ...	7	f.	Girls N. T.
Oct. 3	9	f.	Girls N. T.
Oct. 7	9	m.	Boys N. T.
Oct. 11 ...	10	f.	Girls N. T.
Oct. 13 ...	10	f.	Girls N. T.
Oct. 14 ...	10	f.	Girls N. T.
Oct. 22 ...	5	m.	Infants N. T.
Oct. 29 ...	8	f.	Girls N. T.
Oct. 31 ...	10	f.	Girls N. T.
Nov. 3......	9	m.	Boys N. T.
Nov. 20 ...	4	m.	Infants N. T.
Nov. 25 ...	6	f.	Infants T. (brother)
Dec. 1......	4	f.	Infants N. T.
Dec. 19 ...	9	m.	Boys T. (return)
Dec. 23 ...	7	m.	Infants T.
Dec. 26 ...	8	m.	Boys T.
Dec. 27 ...	5	m.	Infants T. (return)

Both in the first and second halves of the year the disease persists in the infants' department, but never attains any intensity. In the girls' department also the disease is evidently transmitted at school, but only in October is there any degree of intensity of infection.

No. on School Register, 131 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Feb. 10 ...	7	f.	Mixed N. T.	Oct. 19 ...	6	m.	Infants N. T.
May 3	6	f.	Mixed N. T.	Oct. 29 ...	12	f.	Mixed N. T.
June 12 ...	13	m.	Mixed N. T.	Nov. 3......	8	m.	Mixed N. T.
Aug. 7......	9	m.	Mixed N. T.	Nov. 4......	9	m.	Mixed N. T.
Aug. 28 ...	7	m.	Mixed N. T.	Nov. 25 ...	11	m.	Mixed N. T.
Aug. 28 ...	10	f.	Mixed N. T.	Nov. 25 ...	11	f.	Mixed N. T.
Sep. 2	10	m.	Mixed N. T.	Nov. 29 ...	6	m.	Infants N. T.
Sep. 22 ...	7	f.	Infants N. T.	Dec. 21 ...	5	f.	Infants N. T.
Sep. 30 ...	9	m.	Mixed N. T.	Dec. 23 ...	11	m.	Mixed N. T.
Sep. 30 ...	10	f.	Mixed N. T.	Dec. 28 ...	6	f.	Infants N. T.

There is invasion of the mixed department both in the first and second halves of the year. There is the usual tenacity of hold, with low intensity of infection.

No. on School Register, 143 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Feb. 2	8	m.	Boys T. (sister)	Sep. 17 ...	12	m.	Boys N. T.
April 8......	6	f.	Infants N. T.	Oct. 2	5	f.	Infants N. T.
June 24 ...	5	m.	Infants N. T.	Oct. 21 ...	5	m.	Infants N. T.
July 6	9	f.	Girls T. (brother)	Dec. 17 ...	7	m.	Boys N. T.
Sep. 3	5	f.	Infants N. T.	Dec. 29 ...	7	m.	Boys N. T.

There is here a possibility of infection in the infants' department.

No. on School Register, 149 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
May 11 ...	8	f.	Mixed N. T.	Aug. 1......	5	f.	Infants N. T.
May 18 ...	4	m.	Infants N. T.	Aug. 25 ...	7	m.	Infants N. T.
May 21 ...	8	f.	Mixed N. T.	Aug. 26 ...	4	m.	Infants N. T.
June 13 ...	10	m.	Mixed N. T.	Sep. 5	8	m.	Mixed N. T.
June 22 ...	10	m.	Mixed N. T.	Oct. 14 ...	6	m.	Infants N. T.
June 23 ...	4	f.	Infants N. T.	Oct. 27 ...	6	m.	Infants N. T.
June 30 ...	11	m.	Mixed N. T.	Nov. 25 ...	9	m.	Mixed T. (brother)
July 20......	9	m.	Mixed N. T.	Dec. 22 ...	7	m.	Infants N. T.

Here there is diffusion in the mixed department in the first half of the year.

No. on School Register, 161 :—

Date of Eruption	Age	Sex	Department	Date of Eruption	Age	Sex	Department
Feb. 15.....	7	f.	Girls N. T.	Sept. 18....	5	f.	Infants N. T.
April 23....	8	f.	Girls N. T.	Oct. 30......	13	f.	Girls N. T.
May 4	4	f.	Infants T. (sister)	Nov. 17....	9	f.	Girls N. T.
Aug. 11.....	3	m.	Infants N. T.	Dec. 9	8	m.	Boys N. T.
Sept. 9......	4	f.	Infants N. T.	Dec. 21.....	12	f.	Girls N. T.

Here there is possibly a persistence of the infection in the girls' department, with a very low intensity of infection.

No. on School Register, 165 :—

Date of Eruption	Age	Sex	Department
Jan. 31	9	f.	Mixed N. T.
Feb. 19	10	f.	Mixed N. T.
Mar. 13	9	m.	Mixed N. T.
April 7	10	f.	Mixed N. T.
May 7	9	m.	Mixed N. T.
July 23	4	f.	Infants T. (brother)
Aug. 28	6	f.	Infants N. T.
Sept. 22	12	m.	Mixed N. T.
Oct. 6	10	f.	Mixed N. T.
Oct. 19	3	f.	Infants N. T.
Oct. 21	13	m.	Mixed N. T.
Oct. 21	9	m.	Mixed N. T.
Oct. 24	9	f.	Mixed T. (sister)
Nov. 5	7	f.	Mixed T. (brother)
Nov. 17	9	m.	Mixed N. T.

There is diffusion in the mixed department in the early months of the year, and again in October and November.

No. on School Register, 183 :—

Date of Eruption	Age	Sex	Department
April 21	5	f.	Infants T.
June 10	9	m.	Boys N. T.
Oct. 2	10	f.	Girls N. T.
Oct. 16	8	m.	Boys N. T.
Oct. 18	12	f.	Girls N. T.
Oct. 19	10	f.	Girls N. T.
Oct. 24	5	f.	Infants T. (sister)
Nov. 7	7	f.	Girls N. T.
Nov. 19	8	m.	Boys N. T.
Nov. 26	9	f.	Girls N. T.
Nov. 24	4	m.	Infants N. T.
Dec. 3	10	f.	Girls N. T.
Dec. 4	11	f.	Girls N. T.
Dec. 12	11	m.	Boys T. (return)
Dec. 22	4	f.	Infants T. (return)

There is decided diffusion in the girls' department from October to the beginning of December, and persistence in the infants' department from the latter part of November.

No. on School Register, 191 :—

Date of Eruption	Age	Sex	Department
March 14	7	f.	Infants T.
Sep. 18	5	m.	Infants N. T.
Oct. 7	11	m.	Mixed N. T.
Oct. 9	5	m.	Infants N. T.
Oct. 19	6	m.	Infants N. T.
Nov. 1	4	m.	Infants N. T.
Nov. 13	8	f.	Mixed N. T.
Nov. 27	4	m.	Infants N. T.
Dec. 1	10	m.	Mixed N. T.
Dec. 2	8	f.	Mixed N. T.
Dec. 3	4	m.	Infants N. T.
Dec. 3	7	m.	Mixed N. T.
Dec. 5	5	f.	Infants T. (brother)
Dec. 21	4	m.	Infants N. T.
Dec. 24	7	m.	Infants N. T.

Diffusion is evident in the infants' department in the latter half of the year, and the mixed department is also invaded.

No. on School Register, 227 :—

Date of Eruption	Age	Sex	Department
Jan. 15......	5	f.	Infants N. T.
March 30...	7	f.	Mixed N. T.
April 18 ...	12	f.	Mixed N. T.
May 9	4	f.	Infants T.
Sep. 6......	10	f.	Mixed N. T.
Sep. 26......	11	f.	Infants N. T.
Oct. 5......	22	f.	Pupil Teacher N. T.
Oct. 21......	5	m.	Infants N. T.
Oct. 22......	5	f.	Infants N. T.
Oct. 25......	5	m.	Infants N. T.
Oct. 28......	7	f.	Girls N. T.
Nov. 1	3	m.	Infants N. T.
Nov. 3 ...	8	f.	Girls T. (sister)
Nov. 5 ...	5	f.	Infants T. (sister
Nov. 6 ...	5	m.	Infants N. T.
Nov. 10 ...	4	m.	Infants N. T.
Nov. 12 ...	6	f.	Infants N. T.
Nov. 13 ...	4	f.	Infants N. T.
Nov. 17 ...	6	m.	Boys N. T.
Nov. 18 ...	4	m.	Infants N. T.
Nov. 19 ...	9	m.	Boys N. T.
Nov. 20 ...	6	m.	Boys N. T.
Nov. 20 ...	4	f.	Infants N. T.

There is marked diffusion in the infants' department from the latter half of September onwards.

No. on School Register, 29 :—

Date of Eruption	Age	Sex	Department
June 24 ...	9	f.	Girls N. T.
June 29 ...	5	m.	Infants N. T.
July 9	9	f.	Girls N. T.
July 20......	7	f.	Girls N. T.
July 27......	11	f.	Girls N. T.
Aug. 10 ...	5	m.	Infants N. T.
Aug. 14 ...	4	m.	Infants T.
Aug. 15 ...	7	f.	Infants T.
Aug. 16 ...	6	m.	Infants T.
Aug. 16 ...	6	f.	Infants N. T.
Aug. 20 ...	5	f.	Infants T.
Aug. 26 ...	8	f.	Girls N. T.
Aug. 31 ...	9	f.	Girls N. T.
Sep. 1	12	m.	Boys T.
Sep. 1	10	f.	Girls N. T.
Sep. 3	12	f.	Girls T. (sister)
Sep. 16 ...	10	m.	Boys N. T.
Sep. 18 ...	7	f.	Girls T. (return)
Sep. 19 ...	5	m.	Infants T. (return)
Dec. 9	5	f.	Infants T. (brother)
Dec. 16 ...	6	m.	Infants N. T.

The girls' department is invaded in the first half of the year, and again early in the second half of the year. There is slight diffusion amongst the infants in December.

No. on School Register, 61 :—

Date of Eruption	Age	Sex	Department
Dec. 31, 1898	5	m.	Infants N. T.
May 23 ...	4	f.	Infants N. T.
July 11......	9	f.	Mixed N. T.
July 19......	7	f.	Mixed N. T.
Sep. 14 ...	7	f.	Mixed T. (brother)
Sep. 17 ...	4	f.	Infants T. (brother)
Sep. 27 ...	9	m.	Mixed N. T.
Nov. 27 ...	6	f.	Infants N. T.
Dec. 5	11	f.	Mixed N. T.
Dec. 8	7	m.	Mixed N. T.
Dec. 14 ...	6	f.	Infants N. T.
Dec. 17 ...	5	f.	Infants T. (sister)

There appears to be slight diffusion both in the girls and infants' departments towards the end of the year.

DIPHTHERIA, MEMBRANOUS CROUP.

The following are the tables relating to Diphtheria and Membranous Croup during the year 1899 :—

DIPHTHERIA, MEMB. CROUP.—ATTACKS IN WEEKS, ACCORDING TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 7	6	April 8	2	July 8	2	Oct. 7	4
,, 14	9	,, 15	1	,, 15	3	,, 14	4
,, 21	7	,, 22	16	,, 22	...	,, 21	6
,, 28	4	,, 29	4	,, 29	2	,, 28	3
Feb. 4	7	May 6	9	Aug. 5	3	Nov. 4	5
,, 11	3	,, 13	3	,, 12	5	,, 11	6
,, 18	2	,, 20	...	,, 19	6	,, 18	10
,, 25	4	,, 27	4	,, 26	5	,, 25	13
Mch. 4	4	June 3	3	Sept. 2	7	Dec. 2	9
,, 11	...	,, 10	5	,, 9	...	,, 9	17
,, 18	3	,, 17	1	,, 16	5	,, 16	9
,, 25	2	,, 24	2	,, 23	...	,, 23	9
April 1	6	July 1	3	,, 30	3	,, 30	2
Total...	57	Total...	53	Total...	41	Total...	97

City total, 248.

DIPHTHERIA AND MEMB. CROUP ATTACKS.—RATES PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1894	1895	1896	1897	1898	Mean	1899
Twelve Notification Towns ...	0·51	0·47	0·62	0·58	0·85	**0·61**	2·06
City of Manchester	0·98	0·76	0·44	0·29	0·36	**0·57**	0·45
Manchester Township.........	0·73	0·48	0·32	0·22	0·20	**0·39**	0·31
North Manchester	1·48	1·39	0·67	0·37	0·70	**0·92**	0·81
South Manchester	0·85	0·58	0·39	0·26	0·26	**0·47**	0·33

Diphtheria, Memb. Croup.—Attacks, Deaths, and Case Fatality per cent. at Different Ages.

Ages	Attacks	Deaths	Case Fatality*
Under one year	4	3	75·0
1 to 2 years	28	17	60·7
2 to 3 „	19	12	63·1
3 to 4 „	24	12	50·0
4 to 5 „	38	12	31·6
5 to 6 „	20	10	50·0
6 to 7 „	13	4	30·8
7 to 8 „	20	7	35·0
8 to 9 „	7	1	14·3
9 to 10 „	5	2	40·0
10 to 15 „	27	2	7·4
15 to 20 „	13	...	...
20 to 25 „	10	...	...
25 to 35 „	10	...	...
35 to 45 „	5	1	20·0
Over 45 „	5	1	20·0
All ages	248	84	33·9

* The percentages in this column are the actual proportions of fatal cases to the attacks at those ages.

Diphtheria, Memb. Croup, 1891–1899.—Attacks, Deaths, and Case Fatality per cent. at Different Ages.

Ages	Attacks	Deaths	Case Fatality per cent.
Under one year	103	78	75·8
1 to 2 years	274	182	66·5
2 to 3 „	282	171	60·6
3 to 4 „	326	152	46·6
4 to 5 „	302	118	39·0
5 to 6 „	233	97	41·6
6 to 7 „	134	37	27·6
7 to 8 „	137	33	24·1
8 to 9 „	107	18	16·8
9 to 10 „	94	13	13·8
10 to 15 „	340	23	6·8
15 to 20 „	274	15	5·5
20 to 25 „	225	7	3·1
25 to 35 „	283	9	3·2
35 to 45 „	139	4	2·9
Over 45 „	69	3	4·3
All ages	3,322	960	28·9

DIPHTHERIA AND MEMBRANOUS CROUP.—ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	12	0·27	50·0	58·3
Central	11	0·31	18·2	72·7
St. George's	22	0·34	40·9	45·4
Cheetham	24	0·76	58·3	33·3
Crumpsall	15	1·46	26·7	60·0
Blackley	1	0·12	...	100.0
Harpurhey	5	0·38	40·0	...
Moston	7	0·99	28·6	14·3
Newton Heath	35	0·92	20·0	51·4
Bradford	18	0·76	22·2	66·7
Beswick	4	0·36	50·0	25·0
Clayton	11	2·51	27·3	18·2
Ardwick	12	0·31	25·0	41·7
Openshaw	3	0·09	66·7	33·3
Gorton (West)	2	0·07	50·0	...
Rusholme and Kirk.	19	0·94	21·1	42·1
Chorlton-on-Medlock	18	0·29	33·3	55·6
Hulme	29	0·41	44·8	37·9
City of Manchester	**248**	**0·45**	**33·9**	**45·1**

† Corrected: the fatal cases are those actually occurring amongst the cases notified.

DIPHTHERIA, MEMB. CROUP MORTALITY.—RATE PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1894	1895	1896	1897	1898	Mean	1899
England and Wales	0·28	0·25	0·29	0·24	0·24	**0·26**	0·29
33 Great Towns	0·38	0·36	0·38	0·31	0·31	**0·35**	0·40
London	0·62	0·53	0·60	0·51	0·40	**0·53**	0·43
Manchester City	0·29	0·21	0·15	0·08	0·09	**0·16**	0·16
Manchester Township	0·27	0·16	0·13	0·08	0·06	**0·14**	0·12
North Manchester	0·37	0·37	0·23	0·10	0·15	**0·24**	0·26
South Manchester	0·24	0·16	0·12	0·08	0·08	**0·14**	0·11
67 Smaller Towns	0·19	0·23	0·25	0·24	0·28	**0·24**	0·28
Rural Districts	0·24	0·19	0·23	0·19	0·18	**0·21**	0·21

PREVALENCE OF DIPHTHERIA IN AUTUMN.

The first of these tables shows that in 1899 diphtheria was much more prevalent in the last quarter of the year than in the first three, and that it was least prevalent in the third quarter. This agrees with what we find in two out of the three preceding years. The precise significance of this I cannot yet pretend to determine.

INCIDENCE ON MANCHESTER.

From the next table it will be seen that the rate of attack on the inhabitants of this city was not one quarter of the attack rate on 12 notification towns selected for comparison. But, then, it must be remembered that by means of the bacteriological examinations we eliminate a large number which would otherwise be included amongst the cases notified.

The attack rate was, nevertheless, higher in 1899 than in 1898, and higher in 1898 than in 1897. We are, in fact, on an ascending wave.

FATALITY OF THE DISEASE ACCORDING TO AGE.

From the next two tables we find that the percentage of cases dying is highest in infancy and declines up to the age period 35 to 45. After this it undergoes a slight increase.

DISTRIBUTION IN THE CITY.

This is exhibited for Sanitary Districts, both as regards the proportion of persons attacked and the percentage of those attacked who die.

The percentage of persons attacked removed to hospital is shown in the same table.

The districts most severely attacked in 1899 were Crumpsall and Cheetham, Newton Heath and Moston, Bradford and Clayton, and Rusholme. The character of the disease appeared to be most severe in Cheetham and Openshaw.

Towards the close of the year the disease became much more prevalent in Crumpsall and Cheetham, in Clayton, and in Rusholme. As regards the first district there could be no doubt that a school in the district was largely responsible for its spread. To a less extent this may have been so in Rusholme. As regards Clayton, part of the very heavy incidence of the disease is due to the great extent to which the population is under-estimated; but, in addition, it is doubtful whether all the cases were diphtheritic that were notified from this district.

BACTERIOLOGICAL INVESTIGATIONS.

The following are the numbers relating to the bacteriological examination of cases :—

Examined and found positive	Examined and found negative, but the diagnosis is adhered to	No specimen taken
138	24	73
Cases removed to Monsall	**Cases notified by Certificate**	**Cases examined and found negative, of which the result was accepted**
112	334	311

It will be seen that the total number of examinations was 473, and that of these only 138 gave a positive result, while in 24 cases the medical attendant adhered to his diagnosis.

The total number of cases finally accepted was 247, of which 112 were removed to Monsall Hospital.

The percentage of cases accepted in which the medical man adhered to his diagnosis was 10.

If, however, we take all the cases examined bacteriologically and certified, viz., 546, the percentage was 4·4, which agrees with the figure for last year.

An examination into the details of the bacteriological diagnosis shows, however, various points requiring attention.

NUMBER OF CASES EXAMINED FROM MONSALL HOSPITAL.

It was considered necessary to diminish the difficulty placed in the way of sending cases to Monsall without losing the advantage to administration of a bacteriological examination. Accordingly, a number of cases were removed to the hospital, and swab specimens were taken from the throat at the hospital. But this did not answer well. It greatly increased the difficulty of distinguishing between scarlet fever and diphtheria in time for effective separation, and in a few cases the specimens were not taken till the patient had been in the hospital for some time.

It is very desirable that we should return to the plan of making it difficult to have cases removed without a bacteriological examination—at all events for diphtheria. The actual number of cases admitted into Monsall without previous examination and examined bacteriologically shortly after admission during 1899 was 53. Of these, 27 gave positive results and 26 gave negative results.

After all, these form but a small proportion of the total number of examinations, sufficient, however, to cause mischief.

I have thought it desirable carefully to examine the inspector's records in reference to the 24 instances in which the medical attendant definitely adhered to his diagnosis of diphtheria.

These were :—

No.	Age	Sex	
24	6	M	This illness began with lassitude and sore throat on January 18th. At the visit of the inspector on January 26th the patient was quite well, and singing lustily.
36	2	M	Diagnosis, nasal diphtheria. No distinctive symptoms.
39	5	F	Child had been in Pendlebury Hospital suffering from a wasting disease. Returned home February 1st; took ill with croupy cough February 21st; died on day of admission.
65	10	M	Discharged from Monsall Hospital as diphtheritic. Same family as 63 and 64, who gave positive results. No subsequent specimens taken after admission into the hospital.
67	2	F	Do. do.
68	6	M	Do. do.
81	45	F	Illness began with sore throat and pains in the limbs. Patient subsequently had swollen feet, and consequent difficulty in walking. Probably not diphtheria.
90	4	F	Took ill with shivering, swollen face, and headache. Very doubtful case.
102	12	F	Took ill with headache, and next day was sick and had sore throat (possibly scarlet fever).
126	5	F	Took ill suddenly with sore throat; removed to hospital, and died next day. (Scarlet fever ?)
145	7	M	Probably diphtheria.
153	1½	F	Nothing definite ascertained in reference to this case.
155	31	M	Sudden onset of headache and sore throat (possibly scarlet fever).

No.	Age	Sex	
161	1	M	The practitioner who first notified was doubtful. Death certified diphtheria by another medical man.
165	3	F	Taken ill with vomiting and scarlatinal rash. Death certified diphtheria (clearly scarlet fever).
166	11	F	Brother recently removed to hospital with positive report.
186	5	F	Death certified diphtheria. Medical man otherwise uncertain.
189	28	M	Incomplete report.
201	5	M	Probably diphtheria.
212	13	F	Throat covered with white spots (follicular tonsilitis ?).
213	24	F	Commenced suddenly with headache and sore throat. (Scarlet Fever ?)
214	10	F	This girl twice previously reported by the same medical man—in August, 1897, and January, 1898. Negative at first examination, positive at second, and negative at third. It is doubtful whether one attack of diphtheria does not give immunity against a second for a considerable time.
223	3	F	Taken suddenly ill, next day throat much inflamed.
224	4	M	Onset sudden, headache and sore throat. This child had played with a family affected with diphtheria.

Making every allowance then, it is certain that some cases are not recognised by the aid of the bacteriological test, and it is probable that out of the 311 examinations accepted by medical practitioners a small percentage are erroneous, and that this would be revealed by a careful inquiry into the sequelæ in these cases.

This inquiry we propose to make.

It is not difficult to say why the test fails in a certain percentage of the cases. In the first place, the bacteria are apt to be destroyed by the application of disinfectants to the throat. In the second place, they may not be present on the surface of the membrane, and yet may be abundantly present in the throat.

That the second is a valid reason is shown by the fact that three swabs from three members of one family all failed to give bacterial growths, while three swabs taken directly after admission to Monsall all gave a positive result.

The manner in which the preparations are taken is thus of much consequence.

Seventy-three cases out of 546 in which no specimens were taken appears a high proportion. But it includes 12 cases of membranous croup and 8 cases admitted into hospital without preliminary examination, besides a number of cases with severe symptoms in which it was considered undesirable to distress the patient.

There can be no doubt about the great value of the examinations in aid of the clinical diagnosis and to prevent administrative mishaps, and extensive use has been made of them by Dr. Marsden in protecting the scarlet fever wards against invasion by diphtheria.

RETURN CASES OF DIPHTHERIA.

It has already been mentioned under the head of scarlet fever that the view of return cases of scarlet fever held by your Medical Officer of Health suggests a similar occurrence in the case of diphtheria.

As a matter of fact, the number of cases of diphtheria discharged in 1899 was 73.

The cases at home presumably due to cases discharged from Monsall are Nos. 6, 10, 180, and 183. No. 183 must be rejected, as the case was probably scarlet fever, *sine eruptione*. In the instance of No. 180 the interval was 16 days. Thus, only No. 6 and No. 10 remain in which infection may probably have occurred through the discharged case.

This is altogether too uncertain for reasoning, and the question must be otherwise attacked.

DIRECT INFECTION IN DIPHTHERIA.

It is generally considered that diphtheria is most commonly caught by direct infection, and the source of the disease should therefore generally be traceable.

This is very far from being the case. The figures are as follows :—

Cases reported + traced to previous cases reported positive	23
,, + traced to case reported negative... ...	3
,, — ,, ,, positive	4
,, — ,, ,, negative... ...	1
,, + traced to cases in which no sample has been taken	17
,, — ,, ,, ,, ...	3
Cases in which no specimen has been taken traced to cases reported positive	2
,, ,, ,, negative	3
Cases in which no specimen has been taken traced to cases in which no specimen has been taken	4
Total...	60

Thus, in nearly one quarter of the cases the source of the disease was ascertained with some approach to precision in a previous attack. The bacteriological examination is not of the same value in this disease as in enteric fever, in enabling us to identify attacks which have apparently passed over; but, on the other hand, it helps us very much in ascertaining slight cases of the disease which would otherwise be entirely overlooked.

PARALYSIS FOLLOWING DIPHTHERIA.

One of the most valuable means of tracking the course of diphtheria is by means of the slight paralyses which occur during convalescence. Before the examination of samples in the bacteriological laboratory by cultures came to our aid, reliance was largely placed on paralysis occurring during recovery to determine how far an outbreak of sore throat had been diphtheritic in nature, and even now it is the only means of tracing with certainty an outbreak which has passed over.

In all cases, therefore, in which the diagnosis of diphtheria has been arrived at, the inspector at his final visit on the release of the patient from isolation records on a printed form any sequelæ of this kind which he may have ascertained from the parents. The results are given in the following table, after careful elimination of irrelevant matters:—

CASES TREATED AT HOME.

No.	Bact. Exam.	Sequelae
1	+	Nasal speech, difficulty in swallowing
3	+	Drooping of eyelids, loss of vision
10	—	Nasal speech
11	+	Difficulty in swallowing
21	+	Drooping of eyelids, nasal speech, loss of vision, difficulty in swallowing
22	—	Drooping of eyelids, loss of vision
29	+	Nasal speech, difficulty in swallowing
30	+	St. Vitus's dance
46	+	Nasal speech
51	+	Nasal speech, slight attack of paralysis
54	+	Nasal speech, difficulty in swallowing
62	+	Nasal speech

No.	Bact. Exam.	Sequelae
63	+	Nasal speech, difficulty in swallowing
70	+	Nasal speech, difficulty in swallowing
73	+	Nasal speech, difficulty in swallowing
79	+	Drooping of eyelids, nasal speech, loss of vision, difficulty in swallowing
93	+	Nasal speech, difficulty in swallowing
96	None taken	Sudden death during apparent recovery
99	+	Drooping of eyelids, loss of vision, nasal speech, difficulty in swallowing
100	None taken	Loss of vision
113	+	Slight drooping of eyelids, nasal speech, loss of vision
116	None taken	Sudden death during apparent recovery
122	+	Drooping of eyelids, loss of vision, nasal speech, difficulty in swallowing
136	+	Sudden death during apparent recovery
140	None taken	Nasal speech
160	+	Difficulty in swallowing
183	None taken	Drooping of eyelids, defective vision
187	+	Drooping of eyelids, loss of vision
196	+	Loss of vision
204	+	Sudden death during apparent recovery
207	+	Nasal speech, difficulty in swallowing
210	+	Nasal speech, difficulty in swallowing

It will be seen that there is only one case with a negative reaction followed by paresis, and that this is of a partial character.

The corresponding table for cases treated in the Monsall Hospital, for which I am indebted to Dr. Marsden, is as follows :—

PARETIC AND PARALYTIC SEQUELÆ IN MONSALL HOSPITAL.

Name	Age	Date of Onset	Date of Antitoxin	Amount of Antitoxin	Remarks
S. W. ...	4 years	(?) Jan. 6th or Dec. 25th	Jan. 8th	1500 units	Cardiac irregularity, palatal paralysis, strabismus, ataxia
F. T. ...	11 "	April 5th	April 10th	2000 "	Palatal paralysis
E. W. ...	5 "	May 1st	May 9th	2000 "	Cardiac irregularity
J. F. ...	10 "	June 23rd	June 29th	1000 "	Do. do.
L. J. ...	11 "	July 11th	...	Not known	Cardiac irregularity & palatal paralysis
L. P. ...	19 "	Aug. 7th	Aug. 12th	4000 units	Palatal paralysis
A. L. ...	17 "	Aug. 20th	Aug. 24th	2000 "	Cardiac irregularity, palatal paralysis, and paresis of accommodation (vision)
M. T. ...	7 "	Aug. 29th	...	Not known	Palatal paralysis
E A. ...	3 "	Aug. 30th	Sept. 6th	2000 units	Cardiac irregularity
H. S. ...	4 "	Sept. 27th	Oct. 2nd	3000 "	Do. do.
A. S. ...	8 "	Nov. 11th	Nov. 18th	3000 "	Paralysis of palate and muscles of accommodation
G. R. ...	4 "	Nov 22nd	Nov. 25th	2000 "	Cardiac irregularity
G. C. ...	5 "	Dec. 7th	Dec. 8th	2000 "	Do. do.
			FATAL CASES.		
E. T. ...	4 "	May 13th	May 18th	6000 units	Do. do.
A. H. ...	1 "	Oct. 13th	Oct. 20th	4000 "	Palatal paralysis
F. F. ...	3 "	Oct. 25th	Nov. 1st	4000 "	Cardiac irregularity, paralysis of palate, and diaphragm
J. L. ...	35 "	Dec. 7th	Dec. 13th	4000 "	Palatal paralysis

SPREAD OF DISEASE IN SCHOOL.

Only in one school is there anything like clear evidence that the disease was propagated in the school.

The particulars are given underneath.

No. 67 on Register:—

T. denotes cases treated outside school.

N. T. denotes cases not treated.

Date of Onset.	Age.	Sex.	Department.
May 6	5	f.	Infants N. T.
July 10 ...	7	f.	Infants N. T.
Nov. 13 ...	4	m.	Infants N. T.
Nov. 25 ...	6	f.	Infants N. T.
Dec. 2	3	m.	Infants N. T.
Dec. 3	5	m.	Infants N. T.
Dec. 7	7	f.	Infants N. T.
Dec. 11 ...	4	f.	Infants N. T.
Dec. 14 ...	4	m.	Infants N. T.

RELATION TO FOOD SUPPLY.

No connection has been ascertained with the milk or other food supply.

RELATION TO CLOSETS.

The relation of the cases to closet accommodation is shown by the accompanying figures.

<table>
<tr><th colspan="2">Pails adjoin.</th><th colspan="2">Within 4 feet.</th><th colspan="2">Over 4 feet distant.</th></tr>
<tr><th>Not Defective</th><th>Defective.</th><th>Not Defective</th><th>Defective.</th><th>Not Defective</th><th>Defective.</th></tr>
<tr><td>47</td><td>5</td><td>10</td><td>2</td><td>56</td><td>6</td></tr>
<tr><td colspan="6">Midden—</td></tr>
<tr><td colspan="2">Adjoins</td><td colspan="2">Within 6 feet</td><td colspan="2">Over 6 feet distant</td></tr>
<tr><td colspan="2">15</td><td colspan="2">19</td><td colspan="2">27</td></tr>
<tr><td colspan="6">Water-closet</td></tr>
<tr><td colspan="6">60</td></tr>
</table>

It is interesting to observe that in 1897, 1898, and 1899, in the case of scarlet fever the pail-closets adjoining houses considerably exceed in number those which are four feet or more from the house, while in the case of diphtheria this relation is reversed.

The inference is not certain. It is suggested, however, that scarlet fever has a more intimate relation to pollution of the soil with excreta than diphtheria has.

RELATION TO INSANITARY CONDITIONS OF THE DWELLING.

An examination of the analysis of these cases leaves on the mind the impression that damp and pollution of the soil, not with excreta so much as other forms of organic matter, are in somewhat intimate relation with the disease.

A brief summary will illustrate this.

No. of Cases	Bacterial Examination	Traced to a previous case	Paralysis as a Sequela	Insanitary Condition
2	+	?		Yard and cellar drains defective
4	None taken	—	—	Yard drains defective
5	+	—	—	Back to back house, damp
8	+	—	—	Yard drains defective
11	+	—	Difficulty in swallowing	Yard surface, defective closet without roof
12	+	—	—	House damp
18	None taken	—	—	Waste pipe broken
19	+	—	?	Slop pipe short
20	+	+	?	Slop pipe short
21	+	+	Drooping of eyelids, loss of vision, nasal speech, difficulty in swallowing	Yard drains defective
33	None taken	—	—	Yard and cellar drains defective
36	— Adheres	—	—	Drains and yard surface defective
38	None taken	—	—	Yard surface defective
39	— Death certified, Diphtheria	—	—	Drains defective. Yard surface defective and water lodging
42	— Adheres	—	—	Yard surface defective
44	None taken	—	—	House damp. Yard and cellar drains defective. Yard surface defective
45	+	—	—	Cellar drains defective. Yard surface defective
46	+	—	Nasal speech and difficulty in swallowing	Yard surface defective
47	+	—	—	Slop-pipe short
48	+	—	?	Yard drains defective
52	+	?	—	Yard partly flags and bricks
53	+	+	—	
54	+	+	Nasal speech, difficulty in swallowing, and breathing	
56	+	—	—	Yard and cellar drains. Yard surface defective
60	None taken	—	—	Yard and cellar drains defective

The remaining cases give about the same proportion of similar insanitary conditions.

To sum up, diphtheria is spreading in Manchester. At present one district is more especially affected, viz., Cheetham, which is inhabited by the Jewish community. In this district there has been especially manifested the tendency to overlook slight attacks of the disease. But there is a general tendency to increase in the more outlying portions of the city, and more particularly in certain districts.

These are generally characterised by the poorer character of the house drainage and by the greater dampness of the soil, also by the high proportion of middens. There are also more animals, especially fowls, in proportion to the number of human beings than in the Central districts.

The connection with damp conditions of the soil comes out more markedly in 1899 than in previous years, owing to the greater amount of attention given to defective conditions.

Another feature which has been conspicuous in 1899 is the tendency for diphtheria to follow an attack of scarlet fever.

It cannot be said, however, that as yet we have advanced any further in our knowledge of the precise relation of diphtheria to damp and foul conditions of the soil.

ENTERIC FEVER.

The following are the tables referring to this disease :—

Enteric Fever Attacks Reported in Quarters.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1891............	173	119	180	289
1892............	164	106	156	184
1893............	108	80	220	210
1894............	118	75	135	132
1895...	110	90	100	193
1896............	118	130	108	157
1897............	97	57	137	212
1888............	143	79	134	286
1899............	101	66	104	110

We may now return to the course of Enteric Fever in Manchester in 1899. The usual tables are here inserted for reference :—

ENTERIC FEVER ATTACKS IN WEEKS REPORTED IN 1899, ACCORDING TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 7	12	April 8	7	July 8	2	Oct. 7	12
,, 14	14	,, 15	6	,, 15	...	,, 14	6
,, 21	16	,, 22	7	,, 22	2	,, 21	9
,, 28	12	,, 29	10	,, 29	5	,, 28	7
Feb. 4	5	May 6	3	Aug. 5	5	Nov. 4	10
,, 11	9	,, 13	1	,, 12	5	,, 11	8
,, 18	6	,, 20	6	,, 19	15	,, 18	9
,, 25	5	,, 27	4	,, 26	11	,, 25	10
Mch. 4	3	June 3	6	Sept. 2	12	Dec. 2	9
,, 11	5	,, 10	3	,, 9	10	,, 9	10
,, 18	6	,, 17	4	,, 16	12	,, 16	4
,, 25	3	,, 23	4	,, 23	10	,, 23	7
April 1	5	July 1	5	,, 30	15	,, 30	9
Total...	101	Total...	66	Total...	104	Total...	110

City Total 381

1899.—ENTERIC FEVER ATTACKS.—RATES PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1894	1895	1896	1897	1898	Mean	1899
Twelve Notification Towns...	1·32	1·45	1·38	1·32	1·53	1·40	1·60
City of Manchester	0·88	0·94	0·95	0·94	1·19	0·98	0·70
Manchester Township.........	1·04	0·70	0·88	0·81	1·29	0·94	0·77
North Manchester	0·73	0·98	1·11	0·97	1·42	1·04	0·73
South Manchester	0·86	1·06	0·91	0·99	0·99	0·96	0·64

ENTERIC FEVER ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	42	0·93	19·1	85·7
Central	26	0·73	15·4	96·2
St. George's	43	0·67	14·0	86·0
Cheetham	20	0·63	15·0	40·0
Crumpsall	3	0·29	66·7	66·7
Blackley	5	0·60	20·0	60·0
Harpurhey	19	1·44	10·5	57·9
Moston	6	0·85	...	33·3
Newton Heath	31	0·82	3·2	71·0
Bradford	18	0·76	27·8	66·7
Beswick	1	0·09	...	100·0
Clayton	5	1·14	20·0	40·0
Ardwick	33	0·87	24·3	66·7
Openshaw	20	0·60	25·0	75·0
Gorton (West)	19	0·67	31·6	31·6
Rusholme and Kirk...	11	0·55	18·2	18·2
Chorlton-on-Medlock..	37	0·60	16·2	51·3
Hulme	42	0·59	21·4	66·7
City of Manchester.	**381**	**0·70**	**18·1**	**66·4**

† Corrected; the fatal cases are those actually occurring amongst the cases notified.

ENTERIC FEVER.—ATTACKS, DEATHS, AND CASE FATALITY PER CENT. AT DIFFERENT AGES.

AGES	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year..................	...	...	...
1 to 2 years	...	...	...
2 to 3 "	1	...	...
3 to 4 "	14	...	...
4 to 5 "	8	1	12·5
5 to 6 "	13	1	7·7
6 to 7 "	15	3	20·0
7 to 8 "	11	2	18·2
8 to 9 "	12	2	16·7
9 to 10 "	4	...	...
10 to 15 "	53	3	5·7
15 to 20 "	48	8	16·7
20 to 25 "	73	14	19·2
25 to 35 "	81	17	21·0
35 to 45 "	20	8	40·0
Over 45 "	28	10	35·7
All ages..............................	381	69	18·1

Enteric Fever, 1891–99. Attacks, Deaths, and Case Fatality per cent. at Different Ages.

Ages	Attacks	Deaths	Case Fatality per Cent.
Under one year	6	4	66·7
1 to 2 years	26	8	30·8
2 to 3 „	52	8	15·4
3 to 4 „	95	16	16·8
4 to 5 „	133	15	11·3
5 to 6 „	149	19	12·8
6 to 7 „	140	17	12·1
7 to 8 „	130	15	11·5
8 to 9 „	145	12	8·3
9 to 10 „	131	13	9·9
10 to 15 „	782	92	11·8
15 to 20 „	858	169	19·7
20 to 25 „	761	151	19·8
25 to 35 „	880	230	26·1
35 to 45 „	427	145	33·9
Over 45 „	266	103	38·7
All ages	4,981	1,017	20·4

Enteric Fever Mortality.—Rate per 1000 living, Compared with Mean of Five Years.

	1894	1895	1896	1897	1898	Mean	1899
England and Wales	0·16	0·17	0·17	0·16	0·18	**0·17**	0·20
London	0·15	0·14	0·13	0·13	0·14	**0·14**	0·18
Dublin	0·42	0·29	0·45	0·58	0·49	**0·45**	0·55
City of Manchester	0·17	0·18	0·22	0·18	0·22	**0·19**	0·13
Manchester Township	0·23	0·18	0·28	0·17	0·25	**0·22**	0·15
North Manchester	0·14	0·16	0·18	0·20	0·24	**0·18**	0·11
South Manchester	0·16	0·19	0·20	0·17	0·19	**0·18**	0·14

On referring to the table headed "Enteric Fever Attacks Reported in Quarters," it will be seen that the usual autumnal rise began in the third quarter, corresponding to the early rise of temperature.

On referring to the table showing the enteric fever attacks in weeks, according to date of onset, one sees that the increase commenced sharply in the week ending August 15th.

In the Annual Report for 1898, facts have been adduced showing that this is in relation to a period of rain in warm weather some four or five weeks previously succeeded by a number of warm dry days.

The succeeding tables show that in 1899 Manchester had a mortality from enteric fever less than half that of twelve other notification towns.

The disease was fairly general, but visited the districts of Crumpsall and Beswick with exceptional lightness.

The proportion of cases removed to Monsall Hospital was higher than in any previous year, a tribute to the popularity of the hospital as regards the treatment of this disease.

Not only is the proportion of cases treated in hospital higher than in any previous year, it is much higher.

Out of every 100 cases reported, 18·1 per cent. died. This marks the disease as being of a severe type. Yet in 1897, 1898, and 1899 the proportion of cases dying is less than in previous years. This may be partly due to the increasing number treated in hospital, but mainly arises from the careful circumscription of the diagnosis which the serum test permits.

Enteric fever is pre-eminently a disease of adult life. It appears to attack infants but slightly; to increase sharply at the age of 3; to remain stationary up to the age period 10-15; then to increase up to the ages 25-35. After this the incidence seems to diminish. It is doubtful, however, whether this is a true picture of its incidence. Certainly it is most severe on the recognised cases in infancy, the severity decreasing to the age of 8, after which it steadily increases.

The death-rate per 1000 living in Manchester was, in 1899, 0·13, a remarkably low figure for Manchester, and considerably lower than the death-rate for England and Wales.

The interest of this disease is rather heightened than diminished by the great improvement which occurred in 1899. How terrible a disease enteric fever, in the absence of a good water supply and without the possibility of adequate precautions, is capable of becoming has been shown by the experience of our army in South Africa.

In the Annual Reports on the Health of the City of Manchester several factors in the production of the disease have been considered and elucidated by the facts which have come to the knowledge of the Public Health Office year by year.

We now know that the disease is caused by a microscopic germ or bacillus, which is capable of growing in organic liquids and in polluted soils.

The researches of Dr. John Robertson, the Medical Officer of Health for Sheffield, and those carried out by the Local Government Board, have established the fact that once planted in such a soil it can lead a prolonged existence there, can multiply and grow up to the surface in large numbers. By what means it then reaches the system we do not know for certain.

Whether it is inhaled, or is conveyed from infected surfaces to the mouth by contaminated hands, or alighting on soups, potatoes, and so forth, grows on such materials to a sufficient extent to cause the disease, we do not yet know.

It is certain that it is liable to be carried in contaminated milk, contaminated shellfish, and above all in contaminated water.

But we do not know how contamination may reach the water. We do know that if enteric pollution is introduced into a drinking water it is liable to produce an outburst. But we do not know whether it is so widespread as to avail itself for growth of the autumnal decay of vegetation. Nevertheless, the purer the water supply, other things being equal, the less the incidence of enteric fever.

An examination of the incidence of enteric fever on the various districts supplied with water by the Manchester Waterworks Committee appears to show that neither by avoidable nor by unavoidable contamination at the sources of supply is the disease conveyed to the city.

That being so, it must be admitted that the bulk of the cases of this disease remain unexplained as regards their origin.

The investigations necessary to elucidate the source of the disease are carried out by the sanitary inspectors with unequal degrees of intelligence and interest, and it follows, of necessity, that the information obtained is partial and incomplete.

At the same time, the facts collected are important, and give valuable indications.

DIRECT INFECTION IN ENTERIC FEVER.

Perhaps the most important point to which attention has been directed is the extent of direct infection in the sick room. Particulars have been collected of such facts as have come to hand during 1897 and 1898, and are recorded in the Annual Reports for those years. In giving authenticity to the statement that infection has arisen from overlooked cases, and in securing proper precautions being taken in respect of such cases, the serum test has, in the hands of Prof. Delépine, proved of the utmost value.

The facts for 1899 are as follows : —

List of Cases traced to Direct Infection.

Person infected			Source of Infection		Interval of Illnesses	Remarks
No.	Age	Sex	Relative	Other		
1	27	f. +	Child taken ill Nov. 15 + 2 children do. Nov. 30 +	......	24 days	Nursed children up to Dec. 22nd, when illness commenced.
4	33	m. +	Daughter, Nov. 30 + ...	......	19 days	Daughter nursed at home. Father slept in same room as daughter.
6	33	f. +	2 children Dec. 8 + and Dec. 12 +	......	20 and 16 days	Nursed the children up to Dec. 28th.
23	19	m. +	Overlooked case, about Nov. 17 an uncle (No. 34) +	......	28 days	Degree of contact not stated.
24	4	f. +	Uncle ?	......	44 days	?
35	24	m. +	Three cases next door recently +	......	17 days to 11 days before onset	Slept with one of the cases and shared the food.
39	23	f. +	Brother — overlooked case. Onset Oct. 7, removed Jan. 26	......	......	This patient did not nurse her brother, but was living in the same house. Brother had several relapses, and was removed convalescent Jan. 26th. Patient began Jan. 4th.
40	3	f. +	Mother, No. 39	......	Began Jan. 11	Slept with mother.
			Both from over-	looked case.	See 39	
41	33	m. +	4 previous cases (No. 1).	......	26 days	Slept in same room and helped to nurse the children. Ill two days after his wife.
46	16	f. +	Sister, 462. + Onset in this case (No. 46) January 8th, 1899	......	Onset previous case October 15th, 1898. Nursed at home	Slept with No. 462, 1898. and helped to nurse her
47	8	m. +	Sister +	......	?	From 462
62	13	f. +	2 Sisters, 39 and 40	......	15 and 8 days	Intimate contact in sick room
66	15	m. +	Mother	......	31 days	Mother was in the habit of getting up and moving about when ill. She died
67	7	f. +	Sister, No. 38 +	......	25 days	Slept in same bed and used the same eating utensils
70	8	m. +	3 Sisters +	......	20, 13, and 5 days	Almost constantly in the sick room

+ Denotes that the diagnosis was confirmed by the serum test.

LIST OF CASES TRACED TO DIRECT INFECTION IN 1899—*continued.*

Person infected			Source of Infection		Interval of Illnesses	Remarks
No.	Age	Sex	Relative	Other		
73	10	m. +	Father (No. 41)	......	25 days	Slept in same room as father
74	11	m. +	Sister +	......	25 days	Slept in same room
75	4	m. +	Sisters, Nos. 38 and 67	......	42 and 17 days	Eating from same dishes, &c.
77	16	m. +	Brother and 3 sisters, No. 70	......	22, 15, 7, and 2 days	Not stated. Took his food with the other patients
79	20	m. —	Brother+	......	15 days	Brother died. Diagnosis maintained
80	3	m. +	Sister +	......	18 days	Slept with sister
83	45	m. +	Son +	......	12 days after No 30, 3 days before No. 79	Nursed previous case ; dates probably wrong
85	5	m. +	Sister +	......	Sister, onset Dec. 1st, nursed at home. Patient commenced Feb. 8th	Slept in same room and shared food
87	26	m. +	Mother ?	......	14 days ?	Diagnosis of mother not obtained
92	22	f. —	Sister, No. 55 +	......	20 days	Had been attending to her sister, who was removed to Monsall 20 days before this patient began
103	24	f. +	......	Neighbour	6 months	Recent death at adjoining house July 30th, 1898. Onset in this case January 31st, 1899.
105	18	f. +	Father +	......	26 days	Father removed to hospital five days before illness. Contact. ?
107	20	f. +	......	Neighbour four doors off	5½ months	No direct contact.
110	33	f. +	......	Neighbour seven doors off	Removed to hospital 10 days before illness	No direct contact.
115	26	f. +	......	Neighbour four doors off	16 days	Neighbour, while ill, had been in this house.
117	8	f. (None taken)	Sister +	......	29 days	Sister removed to hospital 15 days before beginning of illness. This patient used bedclothes and washed the utensils of the previous case.

+ Denotes that the diagnosis was confirmed by the serum test.

LIST OF CASES TRACED TO DIRECT INFECTION IN 1899—*continued.*

Person infected			Source of Infection		Interval	Remarks
No.	Age	Sex	Relative	Other		
121	22	f. +	Husband + ...	......	Two months after recovery of husband	
124	23	m. +	Brother, No. 122	......	27 days	These three cases were all together in the same room and had their meals there.
125	27	f. +	Brothers, Nos. 122 & 124	......	34 and 7 days	
139	10	f. +	Sister, No. 143, overlooked case +	......	23 days	No. 143 supposed to be suffering from pneumonia, diagnosed by serum test. Occupied same room.
148	10	f. +	Sister, No. 127 + ...	......	45 days	Occupied the same room.
127	12	f. +	Three previous cases have occurred at this school.			
154	13	f. +	Sister + ...	......	40 days Sister removed to hospital 26 days	Slept with sister.
140	8	m. +	Sister, No. 143 + ...	......	27 days	Occupied same room.
142	27	f. —	Nursed 133 —	Nurse	....	Diagnosed influenza. Re-diagnosed enteric.
158	13	f. +	Father + ...	......	53 days	Contact? There were two cases previous to the father.
159	10	f. +	Sister (158).................	......	13 days	Slept with previous case. There was probably an intermediate case here, or the dates are wrong.
167	28	m. +	....	Landlady	....	Landlady had had influenza for six weeks. No serum test.
176	25	m. +	Previous cases 158, 159, 83, 79, 30	......	Last two cases 22 days and 9 days	Occupied same room as case 158.
178	15	m. (None taken)	Previous cases 158, 159, 83, 79, 30	......	Last two cases 22 days and 9 days	Occupied same room as case 158.
182	10	f. +	Mother + ...	......	36 days	Helped to nurse mother.
186	10	m. +	Ill May 21st	......	......	No clue to source.
188	12	m. +	Ill May 26th	......	......	
191	10	m. +	Brother and sister overlooked + ...	......	37 and 45 days	The brother and sister having an interval of eight days, no doubt had a common undiscovered origin for their illness. All slept together.

+ Denotes that the diagnosis was confirmed by the serum test.

LIST OF CASES TRACED TO DIRECT INFECTION IN 1899—*continued.*

Person infected			Source of Infection		Interval	Remarks
No.	Age	Sex	Relative	Other		
192	6	m. +	....	Back-to-back house	?	There has been a case in the house back to back with this, and, having regard to the use of closets, this probably explains the present occurrence.
193	3	m. +	Cousins, 186 and 188 ...	......	12 days	Cases 186 and 188 visited this patient's house regularly, and spent a good deal of time with him from May 21st to 27th. This patient commenced June 2nd.
194	23	m. —	Wife —	......	15 days	Both diagnoses maintained.
199	21	f. +	Son, No. 193. Infected by cases 186 and 188	......	10 days	Nursed and slept with son. Evidently had a common origin
203	10	f. +	Nursed sister, No. 189 +	......	28 days	
208	20	m. +	Sisters, 127..................	......	85 and 40 days	These slept in same room and ate at the same table to the previous cases.
209	34	m. +	Sisters, 148..................	......	105 and 70 days	
212	10	m. +	Father, no exam.	......	34 days	Father used to kiss his child while ill.
213	26	m. +	Daughter æt. 5 overlooked +	......	20 days ?	Nursed the child. Case detected by serum test.
216	25	m. +	3 cases next door. + Onset in this case June 20	......	Shortest interval 14 days	Wife washed clothing from 3 cases of enteric next door from 30 to 14 days before illness. Wife not ill.
217	21	f. +	Lodger, 216. Onset July 7	......	17 days	Nursed previous case, 216. 216 lodges with 217 and 232.
232	22	m. +	Previous case, wife—217. Onset July 24	......	17 days	Nursed and slept with 217. 217 is this patient's wife. She was removed to Monsall on July 25 after she had been ill 18 days.
247	23	f. +	Sister, 239 + ...	.....	21 days— 7 days	Sister began 21 days before this patient, and was isolated after being ill 14 days.
256	5	f. +	Mother overlooked + ...	......	5 days ?	Mother determined by serum test.
262	3	m. +	Sister 215 + and .... Father 213	......	72 days 53 days	Often in contact with 213.

+ Denotes that the diagnosis was confirmed by the serum test.

LIST OF CASES TRACED TO DIRECT INFECTION IN 1899—*continued.*

Person infected			Source of Infection		Interval of Illnesses	Remarks
No.	Age	Sex	Relative	Other		
274	21	m. +	Lodger, 273, no exam.	......	9-7 days	No direct contact. 273 removed to Withington seven days before this patient's illness after a short illness (about two days).
278	26	f. +	......	Nursing	?	Taken ill shortly after nursing a case of enteric fever. Nurse. Had been nursing a case of enteric one month, and had to leave it when she took ill.
282	15	f. +	......	Child ill at home	11 days	Had done charring at a house to an enteric case on September 8; taken ill September 19.
289	36	m. +	Wife and daughter had diarrhœa; no reaction	......	......	Some common filth.
292	32	f. +	......	Nursing	......	Had been nursing enteric cases at Crumpsall Hospital.
298	8	f. +	Mother + ...	......	13 days	Slept in the same bed and ate from same utensils.
299	6	f. +	,, + ...	......	13 days	Do.
300	3	f. +	,, + ...	......	13 days	Do.
306	19	f. +	Sister + ...	......	16 days ?	Slept with sister, nursed at home.
314	23	f. —	Brother ?	......	18 to 11 days ?	Taken ill October 2nd; nursed brother at Widnes from September 14th to September 21st. No test.
331	29	m. +	......	Concreting floor of a fever hospital Sept. 4th	15 days	Taken ill Sept. 19th.
348	18	f. +	Sister, entirely overlooked. No number. Removed to Monsall and died	......	34 days	348 taken ill Oct. 29th.
349	10	f. +				349 taken ill Oct. 30th.
353	15	m. +				353 taken ill Oct. 30th.
						Father and mother had typhoid fever here three years before.
355	15	m. +	Three previous cases as "influenza"	......	....	Boy's father's employer has just recovered from enteric, and there have been three cases of influenza here. Serum test not obtained.

+ Denotes that the diagnosis was confirmed by the serum test.

List of Cases traced to Direct Infection in 1899—*continued.*

Person infected			Source of Infection		Interval of Illnesses	Remarks
No.	Age	Sex	Relative	Other		
362	42	f. +	Husband, 361 + ...	......	53 days	Case 361 had been overlooked, and was only determined by the serum test.
363	3	f. +	Father, 361 + ...	......	58 days	
364	13	f. +	Two sisters and brother, 348, 349, and 353	......	19 days 53 days	Slept in the same room with previous cases, and in the same bed.
371	17	m. +	Brother-in-law + ...	......	6 days ?	These two patients workea together--hawkers.

+ Denotes that the diagnosis was confirmed by the serum test.

Summary.—In all, there are 84 cases to whom a history of infection by another person attaches. Of these, a history of direct contact, excluding doubtful cases, and others not bearing on direct contact, or those in which the history is insufficient, applies to 66 cases.

The cases excluded are, however, sufficiently interesting. They are—35, 92, 103, 107, 110, 115, 117, 127, 186, 188, 192, 216, 247, 274, 289, 314, 331, 355--18 in number.

Thus, a clear history of direct infection is made out in over one-sixth of the cases, and it may be confidently said that if they were thoroughly investigated the source of the disease would be traced to another person in one-third of the cases. As it is, the origin of the cases is assigned with some degree of probability to a previous case in about one quarter of the cases.

In all these instances, unless a distinct statement to the contrary is made, the diagnosis was confirmed by the serum test. In the few cases in which no test was made the diagnosis was confirmed clinically unless a statement to the contrary is made.

Having regard to the small percentage of error in the application of the serum test in Manchester, this clinical investigation of an important feature of the history of enteric fever, too little regarded in practice and counsel, has a high value. The facts presented are good as far as they go. What the picture needs is completeness.

It is worth noting that from 375 to 409, or from the middle of November to the end of the year, no case is traced to a previous case. Whether this is a natural fact, or is due to the perfunctory nature of the inquiries, owing to some interruption of other work, is not easy to say.

In three instances the second case was a nurse, in two a private nurse, in one a hospital nurse, so that the ordinary knowledge of the precautions requisite does not always suffice to prevent infection.

Two cases throw light on the period between the reception of infection and the appearance of symptoms (viz., 216), which shows that the latent period appears to have been not less than 14 nor more than 30 days.

In case 282 there is reason for supposing that the latent period was 11 days.

These histories of infection, however, are worthy of consideration in connection with the latent period of enteric fever.

Column 6 gives the interval between the commencement of illness in the first case or cases and in the subsequent case.

Now in a few of these the interval is surprisingly short, *e.g.*:—

Interval.	Case.
19 days	No. 4
18 days	„ 80
10 days	„ 199
13 days	„ 298-300

If a case of enteric fever is not infectious until nine or ten days after the commencement of symptoms, the latent period in these cases is reduced to 10, 9, 1, 4 days respectively. The number of these cases, however, is not large. And it is possible that the date of the beginning of illness may not have been clearly ascertained in the infecting or in the infected case.

The particulars given in the above table strongly prove the necessity for stringent precautions as regards the attendant on cases of enteric fever.

They show that other members of the family, except for nursing purposes, should not be allowed in the sick room, and that cases of this disease should be removed to hospital as soon as possible. They also emphasise the necessity for thorough measures of disinfection.

THE CONNECTION BETWEEN ENTERIC FEVER AND CONDITIONS OF THE SOIL.

In the Annual Report for 1898 was given an inquiry into the occurrence of the disease in weeks, the dates of commencement of the disease, and not the dates of notification being taken.

It was there shown that year by year, with one exception, there is a sharp increase, thenceforth sustained, in the number of cases of typhoid fever commencing in a particular week.

It was further shown that this increase corresponds to what is described as a critical rainfall occurring from three to five weeks before, generally terminating about four weeks before the week in which typhoid fever undergoes sharp increase.

It was further shown that this critical rainfall has almost invariably been preceded and followed by a drought of some duration.

The critical rainfall invariably occurs on an ascending ground temperature.

Further, it appears that a sharp increase in the number of deaths from summer diarrhœa occurs from a week to a fortnight after the period of critical rainfall.

The suggestion is that the ground is prepared by the preceding drought, which serves to kill off large numbers of germs which might conflict with the growth of the germs of summer diarrhœa and enteric fever; that when the ground has been saturated with moisture these germs, previously confined to soils soaked with excrement—to particular infected areas – rapidly extend in the soil and come close to the surface, or in shady places grow on the surface; and that the subsequent drought serves to detach these germs still viable, and permits them to be carried by light winds to food, or perhaps directly to the lungs of susceptible persons.

How, now, are the facts for 1899?

We observe that there is a sharp increase in the number of attacks in the week ending August 19th, a rise which is sustained.

There are three rainfalls which might be supposed to influence this rise: one on July 9–11th, one on July 18th, and one on July 22nd. The first rainfall amounted to 0·498 inches, the second to 0·136 inches, and the third to 0·200 inches.

It may be that each of these rainfalls contributed to favour the growth of colonies of the bacillus near the surface of the soil, the atmospheric temperature being high, especially after the last rainfall. Each was preceded and followed by dry weather.

Having regard to the interest which must attach itself to such a relationship as that suggested between the first increase of enteric fever and a previous critical rainfall, I requested Dr. Coates to take the enteric fever attacks day by day, and compare them with the preceding daily conditions of rainfall and temperature. This he has done for four years, with the result that what seemed, before this sub-division was made, to stand out sharp and clear is still manifest, but in a less prominent fashion. Partly, no doubt, this is the result of the small numbers concerned, and partly also it may be due to the impossibility which often exists of fixing on any day absolutely as the day on which an attack of enteric fever has begun.

The particulars given in the Report for 1898 require to be rewritten, thus:—

1896.—A slight increase in the number of enteric attacks occurs from August 6th to August 12th. This corresponds to a rainfall of 0·575 inches on July 8th and 9th. The interval is 27 days.

Another rise occurs from August 17th to August 22nd, also slight. This corresponds to a rainfall on July 21st to July 25th extending slightly on to July 30th. This gives an interval of 18 to 23 days.

A sharp rise occurs on August 30th to September 5th. To this corresponds a rainfall on August 13th of 0·245 inches, an interval of 17 days.

1897.—In this year a very definite increase sets in on August 22nd, corresponding to a rainfall on July 24th to July 28th of 1·006 inches, preceded and followed by dry, warm weather. The interval is 24 days.

1898.—Here again a very definite and sharp increase begins on August 30th, corresponding to a rainfall from August 2nd to August 10th, preceded and followed by dry weather. The interval is 20 days.

1899.—A small rise takes place from August 3rd to August 6th, which may be in relation to the rainfall on July 9th to July 11th. Interval 21 days.

The definite rise of the year begins on August 14th. If this is in relationship between the rainfall of July 22nd the interval is 22 days.

Assuming, now, that the relationship between the first sharp increase of enteric fever and a rainfall preceded and followed by dry weather does exist, it follows, on the hypothesis that there is a new growth of the bacillus entericus near the surface in the interval following the cessation of rain, that this makes itself felt at some particular period in the interval.

In all four years the temperature soon begins to rise after the cessation of rain, and if we take the highest mean daily temperature as marking a period at which the bacillus will already have become abundant, the intervals between this and the commencement of increase of cases are—in 1896, 16 days; 1897, 17 days; 1898, 16 days; 1899, 12 days.

But it is only in the commencement of the autumnal rise that the above relation to rainfall makes itself manifest, and it may be that later on other factors are imparted into the progagation of this fever.

As regards any connection between the abrupt increase in autumn of attacks of enteric fever and the temperature at a depth of 4 feet, it is difficult to form a hypothesis of what such a relation should be, and, at all events, no relationship whatever is discoverable by mere examination of the data.

CONTINUED PROPAGATION OF ENTERIC FEVER DUE LARGELY TO LATENESS OF NOTIFICATION.

When a case of enteric fever has been notified, precautionary measures are at once taken, which must go far to prevent further spread in the household or soil.

But these measures are helpless to prevent infection in view of the late period at which many cases are notified.

To show this, it suffices to give the average period between the commencement of illness and notification in the first 100 cases notified in 1899. This was 16 days.

To what this is due has not been systematically determined. But partly it arises from failure on the part of the persons concerned to appreciate the gravity of the illness at an early period, and partly it is due to the delay of medical men in getting the serum test applied. It is true this is better delayed till after the first week of illness.

It is to be hoped that every effort will be made by medical men to abridge this period as much as possible. Indeed, an improvement has taken place in this respect.

ENTERIC FEVER AND SHELLFISH.

The data recorded by the sanitary inspectors as to the connection between an attack of enteric fever and the consumption of shellfish 7 to 21 days previously have been collected by Dr. Coates in the following table :—

No. of case	Raw or Cooked	Interval between eating the Shellfish and onset of Illness	If partaken of by other Members of Family	Remarks
7	Cooked mussels	7 days	Not partaken of by others	......
8	Raw mussels	Ate them frequently	Not partaken of by others	......
11	Raw mussels	Every other night	Husband also partook	......
19	Raw mussels	About 3 weeks	Sister also	Both patient and his sister partook of these mussels, and both had enteric fever. She began 3 days before this patient
22	Raw mussels	10 days	Rest of family also	Here also patient's sister had enteric fever, commencing 3 days before this patient
59	Mussels, raw and cooked	7 days	Wife also	Wife had some of the mussels, but did not eat any raw, while patient had them raw and cooked
64	Cooked mussels	Took them every week	Family also	......
65	Raw mussels	11 days	Family also	......
82	Raw oysters	11 days	Husband also	......
91	Raw and cooked mussels	20 days	No others partook	......
97	Raw mussels	7 days	Rest of family also	......
106	Raw mussels	14 days	No others partook	......
119	Raw and cooked mussels	Frequently ate them	Rest of family also	......
122	Cooked mussels	?	Rest of family also	Two other suspicious cases of illness in this house about same date as this case, but not notified as enteric. All had the shellfish
147	Cooked mussels	21 days	No others partook	Had diarrhœa the day after eating the shellfish

No. of case	Raw or Cooked	Interval between eating the Shellfish and onset of Illness	If partaken of by other Members of Family	Remarks
153	Raw mussels	Frequently ate them	Rest of family also	......
155	Cooked mussels	12 days	Wife also	......
163	Raw and cooked mussels	Frequently ate them	Husband had cooked mussels	......
164	Raw mussels	14 days	Wife also	......
165	Raw mussels	12 days	No others partook	......
167	Cooked mussels	9 days	No others partook	......
175	Raw mussels	3 weeks	Rest of family also	......
284	Cooked mussels	14 days	Rest of family also	Patient is the wife who prepared the food, and possibly may have eaten some raw
317	Cooked mussels	10 days	Rest of family also	Do.
335	Cooked mussels	7 days	No others partook	......
344	Cooked mussels	9 days	Rest of family also	......
358	Cooked mussels	3 days	Rest of family also	......
374	Raw mussels	Frequently partook	Wife also	Wife was ill for about a week a few days before patient with headache, weariness, &c.
378	Cooked mussels	13 days	Rest of family also	Patient prepares the food, and may have eaten some raw
382	Cooked mussels	2–3 weeks	Husband also	Do.
384	?	2 days	Rest of family also	......
388	Raw mussels	Frequently ate them	No others partook	......
390	Raw mussels	Frequently ate them	No others partook	......
398	Raw oysters	3 weeks	Rest of family also	......
402	Cooked mussels	2 weeks	Rest of family also	......
404	Cooked mussels	3 weeks	Rest of family also	......
405	Raw oysters	Twice a week	Rest of family also	......
2	Raw oysters and mussels	About 1 month	No others partook	At Blackpool
235	Raw oysters	10 days	No others partook	At Blackpool
258	Raw oysters	23 days	No others partook	At Southport, patient had been poorly since the day he had oysters and tinned salmon at Southport
365	Raw oysters	?	No others partook	At Blackpool

There appears from this table to be, at all events, a suggestion that the consumption of shellfish played some part in the causation of enteric fever.

In some of these cases the information supplied is incomplete.

In 15 of these cases the shellfish was said to be cooked before it was eaten.

In four out of these 15 cases the patient was the wife, who prepared the food for the table, and who would very probably eat some of the mussels before cooking.

In other cases it is not certain that none were eaten raw.

In 10 cases the patient was the only member of the family to partake of the shellfish.

In two of the cases (19 and 22) in which other members of the family partook of the shellfish there was another patient with enteric fever who also had partaken of the shellfish, and whose illness began within three days of the case here recorded.

In cases 122 and 374 there were other cases of suspicious illness among the members of the family who had eaten of the shellfish.

These suspicious cases were not notified as suffering from enteric fever, nor was the serum test applied.

The following particulars relating to the possible connection of attacks with the consumption of ice creams, with attendance at school, and with the conveniences used at the workshop, have also been collected by Dr. Coates from the summary prepared by me of the reports on cases of enteric fever.

The evidence showing any connection between enteric fever and the consumption of ice cream is very incomplete.

In the following cases, in which no other source of infection could be traced, there was a history of having eaten ice cream.

No. of Case	Interval between Time of Eating and the beginning of Illness	Remarks
9	Every Sunday and Saturday...	......
10	14 days	......
13	Every Sunday	Made in a small yard containing a privy midden
56	14 days	......
60	8–10 days	......
81	8–10 days	......
185	11 days	......
189	Every Sunday	......
196	4 days	......
270	6 days	Another member of the family had some of the same lot of ice cream, and has also been "not so well"
277	8 days	......
297	Frequently	......
317	Frequently	......
328	20 days	......
334	?	......
339	Every Sunday	......
358	Frequently	......
357	3 weeks	......
370	Frequently	......
382	Very frequently................	......
387	Frequently	Storage bad
388	Frequently	......
393	Much ice cream. Frequently	......
407	Frequently	......

ENTERIC FEVER AND SCHOOLS.

In the case of one school only, does there seem to be any ground for suspecting enteric fever to be acquired while at school.

At this school, six cases of enteric fever occurred during the year.

No. of case	Date of Onset	Age	Sex	Department	Infection
125	March 13th	7	F	Girls	Infected from brother outside school
189	May 18th	7	F	,,	Not traced
192	May 30th	6	M	Infants	,,
203	June 15th	10	F	Girls	Sister, 189
381	November 23rd	8	F	,,	Not traced
407	December 19th	6	F	Infants	,,

All these cases were in the girls' and infants' department, both of which use the same closets.

There were five cases of enteric fever notified among the workmen at a large works in Openshaw.

Case	Onset	Occupation	Screen test	History of Infection	Result
42	Jan. 2nd	Coach Painter	+	None	Died
135	Mar. 21st	Puddler	No test applied	,,	,,
261	Aug. 19th	Waggon Maker	+	,,	,,
295	,, 28th	,,	Medical man adheres to his diagnosis	,,	Recovered
383	Nov. 15th	Furnace man	+	,,	Died

These men worked in various departments, but all used the same closets.

These are Adams' trough closets, which are flushed automatically four times a day.

They were, however, not kept clean, as on one occasion the inspector reports that both stalls and troughs were in a filthy state at the time of inspection, the backs of the troughs being coated with accumulations of excreta adhering to them. On another occasion the report runs :—"Since previous visit the closets had been cleaned, but were freshly soiled."

It is evident that soiling of the closets with excreta was a common occurrence, and the conditions favourable to the spread of enteric fever are found at these works.

At another adjoining works, where an equal or greater number of men find employment, only one case of enteric fever occurred, and this case was traced to a probable source of infection outside the works.

The figures showing the relation of pails, middens, and water-closets to enteric fever are as follows :—

PAIL-CLOSETS WITH A URINE GUIDE.

Adjoining the house			Within 4 feet of the house			4 feet or more distant		
Floor dry	Floor wet	Otherwise defective	Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective
101	3	15	7	1	5	108	2	11
119			13			121		

Total, 253.

PAIL-CLOSETS WITHOUT A URINE GUIDE.

Adjoining the house			Within 4 feet of the house			4 feet or more distant		
Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective
2	1	5	1	0	0	3	2	0
8			1			5		

Total, 14.

MIDDEN CLOSETS.

Adjoining the house			Within 6 feet			6 feet or more distant		
Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective
12	1	7	6	1	1	26	0	2
20			8			28		

Total, 56.

WATER-CLOSETS.

66

Total number of pail-closets = 264, of which only 11 are without urine guides and 37 otherwise defective, giving a total of 48 pail-closets presenting conditions more than usually favourable to the propagation of disease.

Total number of middens = 56, of which 12 are in a defective condition.

Other insanitary conditions found in houses in which enteric fever occurred are summarised below :—

	Source of infection traced	Not traced	Total
Overcrowding	1	5	6
Defective drainage..................	17	57	74
Dirty condition of house	0	23	23
General insanitary conditions ...	14	57	71

The following cases were infected outside Manchester :—

Case	Where Infected	Remarks
88	America	Taken ill before landing at Liverpool
112	Halifax	Had been working in Halifax a month before onset
136	Barrow	At Barrow for 6 weeks immediately preceding onset
141	Oldham	A tramp—previously at Oldham
201	Belfast	......
252	Bury	A tramp from Bury
253	Ireland	......
290	Accrington	......
399	Preston	Lived at Preston until a day or two before onset
236	Morecambe	No shellfish
235	Blackpool	Raw oysters 2 weeks before onset
239	,, ...	Ice-cream 2 weeks before onset
269	,, ...	Here for 4 weeks previous to onset. No shellfish
288	,, ...	Oysters 7 days before onset
305	,, ...	No shellfish
312	,, ...	Lived here 6 months
365	,, ...	......
246	,, ...	Oysters 15 days before onset

MEASLES.

The following are the rates of mortality for 1899, compared with the mean of the previous five years:—

1899—Measles Mortality.—Rate per 1000 living, compared with Mean of Five Years.

	1894	1895	1896	1897	1898	Mean	1899
England and Wales	0·39	0·37	0·56	0·40	0·41	**0·43**	0·31
33 Great Towns	0·63	0·53	0·71	0·55	0·56	**0·60**	0·46
London	0·76	0·60	0·82	0·43	0·69	**0·66**	0·47
City of Manchester...	0·42	0·96	1·05	1·17	0·50	**0·82**	1·28
Manchester Township ...	0·26	0·94	1·89	1·69	0·48	**1·05**	2·35
North Manchester	0·30	0·70	1·01	0·63	0·56	**0·64**	1·22
South Manchester	0·60	1·11	0·57	1·18	0·48	**0·79**	0·71
67 Smaller Towns	0·31	0·38	0·64	0·43	0·41	**0·43**	0·28
Rural Districts	0·24	0·26	0·43	0·29	0·31	**0·31**	0·21

The deaths from Measles in districts are as follows:—

1899—Deaths and Death-rate from Measles in the various Divisions of the City.

Statistical Divisions		Estimated Population	Deaths	Death-rate
City of Manchester		**546,010**	**699**	**1·28**
I.	Manchester Township ...	144,665	339	2·35
II.	North Manchester.........	147,846	180	1·22
III.	South Manchester.........	253,499	180	0·71
I.	Ancoats	45,219	125	2·76
	Central	35,467	52	1·47
	St. George's	63,979	162	2·53
II.	Cheetham	31,688	29	0·92
	Crumpsall	10,282	11	1·07
	Blackley........................	8,297	7	0·84
	Harpurhey	13,205	15	1·14
	Moston	7,091	9	1·27
	Newton Heath	37,974	51	1·34
	Bradford	23,772	42	1·77
	Beswick	11,161	13	1·16
	Clayton	4,376	3	0·69
III.	Ardwick	38,143	42	1·10
	Openshaw	33,143	10	0·30
	Gorton (West)	28,570	37	1·29
	Rusholme and Kirk.......	20,160	10	0·50
	Chorlton-upon-Medlock..	62,086	37	0·60
	Hulme	71,397	44	0·62

The following are the deaths in quarters, which shows that the disease was most prevalent in the first and second quarters of the year :—

1899—MEASLES.—DEATHS IN QUARTERS IN THE CITY AND IN GROUPS OF DISTRICTS.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	225	312	115	47
Manchester Township ...	120	172	43	4
North Manchester	50	81	28	21
South Manchester	55	59	44	22

The death-rate from measles in 1899 reached the highest amount yet attained in Manchester, being 1·28 per 1,000 of the total population. The number of deaths was 699.

An occurrence of this nature can scarce be described as other than an epidemic, and the increasing and terrible mortality exacted by this disease cannot but call for a strenuous endeavour to meet the difficulties.

It cannot be said that we have produced as yet any serious effect upon the course of the disease.

The history of the relation of the Sanitary Committee to the subject of measles may be summarised thus :—

In 1895 the Medical Officer of Health was called upon to report on a proposal to include measles amongst the diseases notified to the Public Health Department.

The report included an account of the results of notification as it had been carried out in large towns, and was unfavourable to the notification of measles.

The grounds for this position were these :—

1. No favourable influence on the course of measles could be shown to have resulted from notification.

2. A large proportion of the cases (about one-half) would remain unnotified.

3. Notification could not be expected to yield much result without isolation in hospital and without adequate administration.

4. Notification, efficient administration, and adequate hospital provision would each mean a very large sum.

5. After all had been done there would be no security that an outbreak could be controlled, inasmuch as measles is most highly infectious in the early stage, before the appearance of the eruption.

It was, however, not disputed that if a sufficient amount of money and labour were expended some effect could be produced on the course of outbreaks.

The Sanitary Committee endorsed the conclusion arrived at.

It was considered at the same time that matters should not be left in *statu quo*, and a scheme was put forward by which the School Board and the teachers in voluntary schools might aid in mitigating the severity of outbreaks, and by which the people might learn to recognise the essential gravity of the complaint.

This scheme was adopted by the Committee, and, though gradually modified and improved, is very much the plan by which the School Board consider that the difficulty should be met.

The teachers are mentioned because it is with the teachers that the Local Government Board suppose the Health Authority to be in touch, so as to save time. Moreover, the teacher really knows about the matter, and can explain how the disease has spread. This is not, however, a point of vital consequence as compared with others.

Now the possibility of effecting much on these lines altogether depends on the proportion of cases which occur amongst school children, or of which the teachers have immediate cognizance, and on the possibility of recognising, or at all events strongly suspecting, the occurrence of the disease in its very earliest stages.

There must, at the same time, be prompt action taken either by the school authorities or by the Public Health Department, or both, immediately on reasons presenting themselves for strongly suspecting the presence of measles in the school.

On the supposition that this was possible an effort has been continuously made to control the spread of measles with the aid of the schools.

It was never expected that by this means alone measles could be prevented from spreading, but it was hoped that a mitigating influence would be exercised.

It was found, however, that less was effected than might have been expected.

For this there were several reasons. One is the cardinal difficulty that measles is most infectious in the preliminary stage, and that in consequence, unless great care is exercised in detecting and excluding suspicious cases, the disease spreads rapidly in the school. The next is that, for one reason or another, cases were reported to the Health Office so late that no action could be usefully taken upon them (see table, page 86).

The third was the enormous amount of work liable to be suddenly thrown on the Sanitary Inspectors.

In 1895 measles attained epidemic dimensions in Manchester, and it was under the stress of this fact that schools were closed. At first the whole school was closed, but very soon it was found to be sufficient to close only the infant department.

During the epidemic which commenced in 1895, and raged in 1896 and 1897, the infant departments of schools were closed when the proportion of actual cases of measles to the total average attendance exceeded 10 per cent.

By many practitioners this is believed to be too late. By school authorities it is regarded as being too soon. *In medio tutissimus ibis.*

The Sanitary Authority has to look to what happens when, after being closed for three weeks, the department is re-opened. Does the disease reappear and become prevalent again amongst the infants which have re-assembled?

It appears, as a matter of fact, that when 10 per cent. have been affected before closure, this proportion suffices to prevent the disease again becoming epidemic in the infant department, with few exceptions.

If the infant department were closed at an earlier period it is very open to doubt whether such would be the case.

Nothing could be more futile than closure for three weeks at a late period, when even reluctant material has become exhausted, licked up in the flame of the epidemic, as wet grass is burned round a fire.

It presently appeared to your Medical Officer of Health that the closing of the infant department of schools was a proceeding not only useful to the school concerned, but calculated to protect the rest of the community to some extent, and you, therefore, continued this precaution in 1898 when the disease had abated, as it could not fail to do after raging for three years.

In 1899, however, measles broke out more violently than ever, and, if this view was correct, a large number of infant departments were bound to require closing. They were accordingly closed.

The opposition of the School Board became, in consequence, more strenuous than it had been previously, and a report was issued by them objecting to the closure of schools (for schools read infant departments).

The Sanitary Committee again received a Deputation from the School Board, and instructed the Medical Officer of Health to reply to the observations of the School Board. This reply was followed by notes from the School Board in reference to the reply of the Medical Officer of Health, which were presented to the Sanitary Committee at a further meeting. At this point all discussion ended, while the closing of schools was suspended. The Sanitary Committee have deferred coming to a conclusion on the subject.

The reasons which seem to point to the advisability of closing the infant departments of schools, when 10 per cent. of cases have occurred, are these :—

1. The disease has attained epidemic dimensions in Manchester since 1894, and therefore fulfils the conditions of the Local Government Board.

2. Only infant departments of schools are closed, and the closure is restricted to three weeks. This is a procedure viewed with interest and hope by the Local Government Board.

3. It cannot, in the opinion of your Medical Officer of Health, be considered to interfere seriously with the interests of education.

4. This procedure is restricted to measles, and should not extend beyond measles and whooping cough. These diseases are marked off by their early infectiveness.

5. In the Annual Report for 1898 your Medical Officer of Health has endeavoured to show that measles extends with great rapidity through the infant department of schools. This cannot be seriously contested.

6. He has also shown that it extends with comparative slowness amongst children outside school.

7. In a special report presented to the Committee he has endeavoured to make it clear that closure of the infant department of a school when 10 per cent. of the children have been affected, suffices almost invariably to prevent its subsequent extension when the school re-opens, even when the available material has not nearly been exhausted.

8. It is a manifest corollary that the closure of the infant department has, *pro tanto*, prevented the spread of the disease in the community.

9. When a disease like measles spreads in a crowded schoolroom, it may be assumed that it gathers intensity and the benefit of closure to the scholars of a particular school seems undoubted, in spite of arguments to the contrary.

The position placed before the Sanitary Committee was not seriously assailed in the subsequent statement of the School Board.

A curve was exhibited showing that in the earlier half of 1898 more infant departments were closed and more deaths occurred, whereas in the latter half fewer infant departments were closed and fewer deaths occurred.

By parity of reasoning, as no schools have been closed in the first half of 1900, no deaths should have occurred, whereas the number of deaths has again increased.

Naturally, as the disease was more severe, more infant departments would be closed, and as the disease abated fewer would be closed.

Then, again, it is stated that there was in 1899 a falling off of attendance at the elementary schools with a consequent loss of something over £2,000. It is seriously suggested that this was due to the alarm engendered by closing schools on account of measles.

In 1899 there were 699 deaths from measles, and allowing that the fatality was 5 per cent., there would be 13,980 children attacked with measles, a large proportion of whom were school children. If to these are added the absentees from the family invaded, and it is not proposed that these should attend school, a tolerably large encroachment is made on the school attendance without further remission.

Our object is, however, not partial polemics, but to arrive first at the facts, and next at some tolerable *modus vivendi.*

At present measles is overrunning infant departments of schools without interference on the part of the Board or the Corporation, so far as closure is concerned.

It scarcely seems possible that any improvement will relieve the Sanitary Authority, in the cases of measles and perhaps whooping cough, from exercising their statutory powers and closing at least infant departments.

Nothing is more certain than that this procedure will not arrest the course of an outbreak. The utmost that can be looked for from it is that the school will be protected, and that the severity of the disease in the neighbourhood of the school will be mitigated.

That, in fact, this has been the result of school closure, so far as measles is concerned, there can be little doubt, if we look to the course of the disease in neighbouring towns in which schools have not been closed.

Whether, however, the gain has been commensurate with the trouble involved, the Sanitary Committee must determine.

Then, again, as to the present course of administration, the following is a description of the course at present pursued :—

To enable the Public Health Department to become cognisant of measles and whooping cough immediately school children are attacked, the Manchester School Board now furnish the Medical Officer of Health every Monday, as a rule, with lists of all known cases. The particulars are forthwith entered on special inquiry forms, numbered consecutively, and handed to the sanitary inspectors each Tuesday afternoon. The inspectors call at the homes of the children and explain the printed instructions, at the same time warning the parents not to allow the patient to come in contact with other children—in the case of measles for four weeks after the beginning of the illness, and of whooping cough until the whoops have ceased. Isolation, ventilation, and any sanitary defects are also inquired into.

The number of cases of measles and whooping cough in each particular school are then tabulated, and recorded opposite the school in the alphabetical index. The particulars are also written under the school in detail. If five families or more are affected with measles or whooping cough in any school, a circular letter is addressed to the managers asking for the following information :—

1. The ordinary average attendance.
2. The present attendance.
3. The number of children actually suffering from measles or whooping cough (separately).
4. The number of children absent on account of measles or whooping cough in the home (separately).

The parents are warned against nursing their sick children in the kitchen unless absolutely compelled by circumstances, and measures of disinfection to be subsequently taken are explained. Any sanitary defects found are attended to. Inquiries are also made in the neighbourhood of each infected house for any further cases, and if any are found they are dealt with in the same way.

It must be stated that the School Board attendance officers serve my certificates at the homes of the scholars, and also on the head teachers, stopping all children from infected homes attending school as per above instruction.

Occasionally daily sheets of children who are absent and supposed to be suffering from infectious disease are received, which are dealt with in a similar way, but unfortunately the cases are again communicated in the weekly list. If this could be obviated many duplicate forms would be avoided.

When the report forms are returned to the office by the sanitary inspectors they are carefully read through and annotated, if necessary, with a date for further report in case of any defects, or if the child has not recovered a date is given when the inspector has to report as to whether the disinfection, &c., has been carried out.

The inquiry forms are then handed to a clerk, who enters the necessary particulars under each individual school, the actual cases being entered in red ink, and those detained at home on account of the disease in black ink. This register shows the actual number of cases in each school throughout the city, with the date of notification, the commencement of illness, the date of rash, the date last at school, date of visit, and whether a medical man is in attendance or no.

The inquiry forms when done with are placed in numerical order, and where any defects have to be remedied, or disinfection still to be carried out, the forms are again handed to the sanitary inspectors for further reports by certain dates.

Since the Deputation from the Manchester School Board waited upon the Sanitary Committee, objecting to the policy of closing schools where 10 per cent. of the children were actually suffering from the disease in any department of the school, the Medical Officer of Health has simply notified the fact to the Hospitals Sub-Committee where the 10 per cent. has been exceeded in any particular school.

No doubt since the last interview between the School Board and the Sanitary Committee there has been an improvement in the rapidity with which the occurrence of cases is notified. But it will be seen from the following table that very often three or four weeks elapse between the eruption appearing on a child and the visit to the house of a sanitary inspector. The system of postcards projected by the School Board has, as yet, not come into operation.

But no doubt this will be carried out.

The following schools, or portion of schools, were closed in the course of the year :—

SCHOOL	DEPARTMENT
St. Mark's Church of England School, West Gorton	Infant
St. James's Church of England School, Rusholme	Do.
Thomas Street Board School, West Gorton.....................	Do.
Derby Street Jews School, Cheetham	Do.
St. Catherine's Church of England School, Cheetham	Do.
Ross Place Board School, Ardwick	Do.
Bank Meadow Board School, Ardwick	Do.
Albert Memorial Church of England School, Queen's Road	Do.
Sharp Street Board School, Rochdale Road	Do.
St. Michael's Roman Catholic School, Ancoats	Do.
Lancasterian Board School, Ancoats	Do.
Memorial Church of England School, Bradford	Do.
St. Andrew's Church of England School, Homer Street......	Do.
All Saints' Church of England School, Newton Heath	Do.
All Saints' Church of England School, Chorlton-upon-Medlock	Do.
St. Wilfred's Church of England School, Newton	Do.
*St. Peter's Board School, Ancoats	Do.
St. John's Church of England School, Miles Platting.........	Do.
St. George's Board School, Oldham Road	Do
St. Barnabas' Board School, Ancoats	Do.
St. Luke's Board School, Cheetham..........................	Do.
St. Philip's Church of England School, Ancoats	Do.
St. Andrew's Church of England School, Baird Street	Do.
St. Oswald's Church of England School, Rochdale Road ...	Do.
St. Augustine's Church of England School, Monsall	Whole School
St. Saviour's Branch Church of England School, C-on-M. ...	Infant
Clarendon Road Board School, Crumpsall	Do.
St. Mark's Church of England School, Newton	Do.
Holland Street Board School, Newton...........................	Do.
St. Jude's Church of England School, Ancoats	Do.
St. James' Church of England School, Collyhurst	Do.
St. Mark's Church of England School, Cheetham	Do.
St. Ann's Church of England School, Newton..................	Do.
St. John the Baptist Church of England School, Hulme ...	Do.
St. Luke's Church of England School, Miles Platting.........	Do.
Grosvenor Square Board School, Chorlton-upon-Medlock ..	Do.
Christ Church Church of England School, Beswick	Do.
Dob Lane British School, Newton Heath	Whole School
St. Aloysius' Roman Catholic School, Ardwick	Infant
Collyhurst Wesleyan School	Do.
Tuer Street Board School, Chorlton-upon-Medlock	Do.
Smedley Road Board School, Cheetham	Do.
Granby Row Board School, London Road	Do.
Holy Family Roman Catholic School, Chorlton-upon-Medlock	Do.
All Souls' Church of England School, Ancoats	Do.
Eagle Street Wesleyan School, Chorlton-upon-Medlock	Do.
Ten Acre Lane Board School, Newton Heath..................	Do.

School	Department
Every Street Board School, Ancoats	Do.
Holy Name Roman Catholic School, Chorlton-upon-Medlock	Do.
Waterloo Road Board School, Cheetham	Do.
*St. Peter's Board School, Ancoats	Do.
St. Andrew's Church of England School, Blackley	Do.
St. Ann's Roman Catholic School, Ancoats	Whole School
Christ Church Board School, Chorlton-upon-Medlock	Infant
Embden Street Board School, Chorlton-upon-Medlock	Do.
Vine Street Board School, Hulme	Do.
St. James the Less Board School, Ancoats	Do.

Board Schools	23
Church of England Schools	25
Roman Catholic Schools	5
Wesleyan Schools	2
British Schools	2
	57

The following table shows the recent intervals between the date of rash, etc., and the notification of cases:—

Date of Notification	Date of Rash	Last at School	Date of Inspector's visit
June 25	June 16	June 14	July 4
,, 25	,, 17	,, 12	,, 2
,, 25	,, 18	,, 13	,, 4
,, 25	,, 11	,, 11	,, 4
,, 25	,, 15	,, 13	,, 4
,, 25	,, 16	,, 15	June 27
,, 25	,, 15	,, 12	,, 28
,, 25	,, 13	,, 1	July 2
,, 25	,, 11	,, 1	,, 4
,, 25	,, 13	,, 1	,, 5
,, 25	,, 14	,, 12	,, 5
,, 25	,, 16	,, 1	,, 5
,, 25	,, 20	,, 20	,, 5
,, 25	,, 9	,, 1	,, 2
,, 25	,, 18	,, 15	June 28
,, 25	,, 4	May 23	,, 27
,, 25	May 27	,, 25	July 2
,, 25	,, 22	,, 19	June 27
,, 25	,, 26	,, 23	,, 27
,, 25	June 18	June 15	,, 27
,, 25	,, 4	May 23	,, 27
,, 25	,, 11	June 9	,, 27
,, 25	,, 1	May 23	,, 27

Date of Notification	Date of Rash	Last at School	Date of Inspector's visit
June 25	June 13	June 1	June 28
,, 25	,, 9	,, 1	,, 27
,, 25	,, 8	,, 1	July 2
,, 25	,, 9	,, 1	,, 4
,, 25	,, 22	,, 21	,, 4
,, 25	,, 12	,, 1	,, 5
,, 25	,, 4	May 31	,, 5
,, 25	,, 13	June 1	,, 4
,, 25	,, 18	,, 15	,, 4
,, 25	,, 11	,, 1	,, 2
,, 25	May 27	May 25	,, 2
July 2	June 3	,, 23	,, 2
,, 2	,, 15	June 13	,, 2
,, 2	,, 11	,, 11	,, 2
,, 2	,, 17	,, 14	,, 4
,, 2	May 28	May 28	,, 6
,, 2	June 10	,, 31	,, 5
,, 2	,, 8	June 1	,, 5
,, 2	,, 25	,, 19	,, 10
,, 2	,, 21	,, 19	,, 10
,, 2	,, 25	,, 21	,, 5
,, 2	,, 20	,, 19	,, 4
,, 2	,, 20	,, 15	,, 4
,, 2	,, 17	,, 15	,, 12
,, 2	,, 4	,, 1	,, 11
,, 2	,, 21	,, 10	,, 11
,, 9	July 2	,, 29	,, 11
,, 9	,, 9	July 9	,, 12
,, 9	,, 2	June 29	,, 12
,, 9	,, 4	,, 28	,, 12
,, 9	June 27	,, 19	,, 11
,, 9	,, 21	,, 22	,, 16
,, 9	,, 21	,, 16	,, 16
,, 9	,, 21	,, 22	,, 16
,, 9	July 2	July 2	,, 11
,, 9	,, 2	June 20	,, 12
,, 9	June 25	,, 22	,, 18
,, 9	,, 25	,, 22	,, 18
,, 9	,, 30	,, 29	,, 18
,, 9	,, 28	,, 27	,, 18
,, 9	,, 25	,, 20	,, 23
,, 9	July 3	July 2	,, 23
,, 9	June 20	June 19	,, 11
,, 9	,, 28	,, 27	,, 23
,, 9	July 1	,, 29	,, 18
,, 9	June 29	,, 28	,, 23
,, 9	,, 28	,, 26	,, 23
,, 9	July 4	,, 15	,, 23
,, 9	,, 4	July 3	,, 12
,, 9	,, 2	June 26	,, 18

Date of Notification	Date of Rash	Last at School	Date of inspector's visit
July 9	July 1	June 29	July 12
,, 9	,, 9	July 6	,, 12
,, 9	,, 1	June 29	,, 12
,, 9	,, 2	July 2	,, 12
,, 9	,, 4	June 29	,, 12
,, 9	,, 1	,, 29	,, 12
,, 9	June 20	,, 20	,, 12
,, 17	July 9	,, 29	,, 18
,, 17	,, 8	July 6	,, 18
,, 17	June 25	June 25	,, 18
,, 17	,, 26	,, 24	,, 18
,, 17	July 3	,, 19	,, 19
,, 17	,, 1	,, 28	,, 20
,, 17	,, 5	July 4	,, 19
,, 17	June 12	June 10	,, 19
,, 17	July 5	July 3	,, 18
,, 17	,, 8	,, 6	,, 18
,, 17	,, 16	,, 3	,, 18
,, 17	,, 11	,, 6	,, 18
,, 17	,, 5	,, 3	,, 18
,, 17	June 29	June 28	,, 18

The following table gives particulars of certain schools affected in 1900, with the percentage of actual cases of measles and whooping cough in departments at the time of enquiry by the Public Health Office :—

School	Date	Average Attendance	Present Attendance	M'sles	Per Centage	Wh'oping Cough	Per Centage
Armitage Street Board School	March 27th..	246	222	33	13	14	6
Holland Street Board School	May 30th ...	99	103	0	0	12	12
Queen Street Board School...	June 27th ...	236	215	82	35	11	5
St. George's Board School ...	April 3rd ...	172	178	0	0	19	11
St. Matthew's Board School, Deansgate	June 27th ...	121	128	18	15	6	5
St. Michael's Board School, Hulme	May 8th......	203	223	0	0	19	9
Smedley Road Board School	March 27th..	126	137	14	11	3	2
Varna Street Board School...	June 27th ...	445	470	50	11	0	0
All Saints' Church of England School	May 12th ...	86	92	10	12	1	1
Christ Church Church of England School, Harpurhey	June 20th ...	350	287	34	10	16	5
St. Andrew's Church of England School	May 18th ...	133	120	16	12	23	17

School	Date	Average Attendance	Present Attendance	M'sles	Per Centage	Wh'oping Cough	Per Centage
St. Ann's Church of England, Newton Heath	June 11th ...	127	131	23	18	0	0
St. Barnabas' Church of England School, Openshaw	June 25th ...	283	199	97	34	20	7
St. Catherine's Church of England School, Collyhurst	March 24th..	125	145	12	9	7	6
St. Clement's Church of England School, West Gorton	May 26th	196	176	26	13	25	13
St. George's Church of England School, Hulme	March 27th..	148	170	20	13	2	1
St. George's Church of England Branch School, Hulme	F'bruary 26th	123	88	46	37	14	11
St. John the Baptist Church of England School	March 31st...	118	98	18	15	0	0
St. John's Church of England School, Deansgate	June 23rd ...	130	65	50	38	3	2
St. Mark's Church of England, West Gorton	May 19th ...	209	180	28	13	8	4
St. Mary's Church of England Branch School, Hulme	March 24th .	220	189	12	5	29	13
St. Wilfred's Church of England School, Newton Heath	March 23rd..	130	122	15	12	5	4
Corpus Christ Roman Catholic School, Miles Platting	May 12th ...	226	194	31	13	15	7
St. Augustine's Roman Catholic, Granby Row	June 30th ...	205	183	18	9	36	18
St. Bridget's Roman Catholic School	July 5th......	200	189	33	17	4	2
St. Edmund's Roman Catholic School	F'bruary 16th	260	212	24	9	34	13
St. Francis' Roman Catholic School	May 29th...	291	249	64	22	7	2
	June 27th...	326	297	22	7	32	10
St. Wilfred's Roman Catholic School	April 28th ...	240	256	29	12	54	23
Culcheth British School	May 5th......	114	91	16	14	16	14
Blackley Wesleyan School...	February 7th	78	69	14	18	15	19
Collyhurst Wesleyan School	March 24th	132	111	30	23	6	5
	April 24th ..	132	75	12	9	42	32
Grey Mare Lane Wesleyan School	February 21st	160	108	40	25	8	5

WHOOPING COUGH.

The tables relating to this disease show that the death-rate in Manchester for 1899 was decidedly below the average for the preceding five years, yet it exceeded the death-rate for England and Wales by an amount nearly the same as the average for those years.

The rates giving the whooping cough mortality for 1899 are as follows :—

WHOOPING COUGH MORTALITY.—RATE PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1894	1895	1896	1897	1898	Mean	1899
England and Wales	0·39	0·30	0·41	0·35	0·31	**0·35**	0·30
33 Great Towns	0·48	0·37	0·57	0·41	0·42	**0·45**	0·38
London	0·48	0·34	0·65	0·41	0·48	**0·47**	0·38
City of Manchester...	0·55	0·47	0·66	0·56	0·31	**0·51**	0·42
Manchester Township ...	0·55	0·72	0·92	0·68	0·41	**0·66**	0·41
North Manchester	0·45	0·37	0·50	0·29	0·14	**0·35**	0·50
South Manchester.........	0·60	0·38	0·60	0·64	0·36	**0·52**	0·37
67 Smaller Towns.........	0·39	0·32	0·43	0·38	0·27	**0·36**	0·32
Rural Districts	0·33	0·25	0·30	0·31	0·25	**0·29**	0·25

The following are the deaths in quarters, which shows that the disease was most prevalent in the first half of the year :—

1899.—WHOOPING COUGH.—DEATHS IN QUARTERS IN THE CITY, AND IN GROUPS AND DISTRICTS.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	48	87	62	30
Manchester Township ...	12	20	18	10
North Manchester	18	27	20	7
South Manchester	18	40	24	13

The following table shows the districts most affected :—

1899.—DEATHS AND DEATH-RATES FROM WHOOPING COUGH IN THE VARIOUS DIVISIONS OF THE CITY.

Statistical Divisions		Estimated Population	Deaths	Death-rates
	City of Manchester	546,010	227	0·42
I.	Manchester Township	144,665	60	0·41
II.	North Manchester	147,846	72	0·50
III.	South Manchester	253,499	95	0·37
I.	Ancoats	45,219	29	0·64
	Central	35,467	14	0·39
	St. George's	63,979	17	0·27
II.	Cheetham	31,688	10	0·32
	Crumpsall	10,282	1	0·10
	Blackley	8,297	1	0·12
	Harpurhey	13,205	9	0·68
	Moston	7,091	3	0·42
	Newton Heath	37,974	13	0·34
	Bradford	23,772	21	0·88
	Beswick	11,161	13	1·16
	Clayton	4,376	1	0·23
III.	Ardwick	38,143	21	0·55
	Openshaw	33,143	13	0·39
	Gorton (West)	28,570	9	0·32
	Rusholme and Kirk.	20,160	5	0·25
	Chorlton-upon-Medlock	62,086	22	0·35
	Hulme	71,397	25	0·35

The mortality was relatively greatest in North Manchester, and in each of the three main divisions was highest in the second quarter of the year, next highest in the third quarter, and lowest in the last three months. The death-rate was highest in North Manchester in the districts of Beswick and Bradford; in the Central Division in Ancoats; in South Manchester in Ardwick. These four districts are connected.

The mortality from whooping cough has, on the other hand, been excessive in the first half of the present year, being at a rate of 1 per 1000 of the population.

The problem of dealing with this disease is identical with that of dealing with measles. It was arranged towards the end of the year 1899, on the urgent request of the School Board, that no more schools should be closed on account of the excessive incidence of measles pending a consideration of the Report of the Medical Officer of Health.

As only one or two schools have been voluntarily closed, it is a matter of interest to note to what height measles and whooping cough have attained in 1900 in the infant departments, which is shown in a table given under "Measles."

SUMMER DIARRHŒA.

On the 30th June, 1899, the four-foot thermometer stood at 56·0°, the critical point at which Dr. Ballard has shown that summer diarrhœa assumes a prevalent character. The thermometer continued to rise until, on the 29th of July, it stood at 60°·0, and the highest point it reached was 61°·0. From September 4th a fall set in, and on September 30th it stood at 57°·0.

The following are the registered deaths from diarrhœa and simple cholera in weeks during the third quarter of the year :—

July 8th	5
,, 15th	9
,, 22nd	22
,, 29th	42
Aug. 5th	75
,, 12th	103
,, 19th	107
,, 26th	137
Sept. 2nd	128
,, 9th	129
,, 16th	81
,, 23rd	78
,, 30th	32
	948

The numbers of deaths in quarters are as follows :—

DIARRHŒA AND SIMPLE CHOLERA DEATHS IN QUARTERS 1891–1899.

	1891	1892	1893	1894	1895	1896	1897	1898	1899
First Quarter ...	45	32	48	47	51	37	49	55	46
Second Quarter...	64	36	131	55	59	78	50	49	53
Third Quarter ...	217	275	688	212	574	391	803	807	948
Fourth Quarter...	106	75	89	61	220	66	62	179	74
	432	418	956	375	904	572	964	1090	1121

By means of the following table we are enabled to observe the comparative degree of severity with which different districts of the city have been visited. It should be compared with the corresponding tables in recent reports :—

1899.—Deaths and Death-rates from Diarrhœa and Simple Cholera in the various Divisions of the City.

Statistical Divisions		Estimated Population	Deaths	Death-rates	Deaths per 1000 Births
	City of Manchester	546,010	1,121	2·05	63·7
I.	Manchester Township	144,665	376	2·60	78·5
II.	Northern Districts	147,846	295	2·00	57·4
III.	Southern Districts	253,499	450	1·78	58·7
I.	Ancoats	45,219	144	3·18	85·0
	Central	35,467	65	1·83	71·1
	St. George's	63,979	167	2·61	76·7
II.	Cheetham	31,688	43	1·36	36·0
	Crumpsall	10,282	12	1·17	60·9
	Blackley	8,297	10	1·21	44·2
	Harpurhey	13,205	40	3·03	72·6
	Moston	7,091	9	1·27	29·1
	Newton Heath	37,974	67	1·76	57·9
	Bradford	23,772	80	3·37	93·3
	Beswick	11,161	20	1·79	46·4
	Clayton	4,376	14	3·20	66·7
III.	Ardwick	38,143	85	2·23	61·7
	Openshaw	33,143	60	1·81	64·3
	West Gorton	28,570	86	3·01	85·7
	Rusholme and Kirk	20,160	19	0·94	34·0
	Chorlton-upon-Medlock	62,086	83	1·34	58·7
	Hulme	71,397	117	1·64	49·5

By means of the following rates we are enabled to compare the fatality from diarrhœa and simple cholera in Manchester with that prevailing in other parts of the country :—

1899.—DIARRHŒA AND SIMPLE CHOLERA MORTALITY.—RATE PER 1,000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1894	1895	1896	1897	1898	Mean	1899
England and Wales	0·35	0·88	0·55	0·86	0·96	**0·72**	0·98
33 Great Towns	0·50	1·19	0·79	1·24	1·22	**0·99**	1·21
London	0·41	0·82	0·72	0·92	0·97	**0·77**	0·93
City of Manchester	0·72	1·72	1·06	1·79	2·01	**1·46**	2·05
Manchester Township	1·12	2·22	1·44	2·35	2·66	**1·96**	2·60
North Manchester	0·53	1·38	0·80	1·50	1·66	**1·17**	2·00
South Manchester	0·57	1·60	0·98	1·65	1·85	**1·33**	1·78
67 Smaller Towns	0·41	1·13	0·68	1·05	1·09	**0·87**	1·22
Rural Districts	0·24	0·64	0·36	0·56	0·75	**0·51**	0·76

The following table supplies meteorological data for the third quarter of the year, the season in which the disease is most prevalent :—

Third Quarter of the years	Mean Temperature	Rainfall, Inches	Humidity, per cent.	Diarrhœa and Simple Cholera Mortality. Annual Rate per 1,000 living
1887	59°·0	7·7	73 %	3·38
1888	56°·5	11·2	77 %	1·36
1889	57°·7	10·5	73 %	2·61
1890	58°·8	8·1	74 %	2·28
1891	58°·2	12·8	79 %	1·57
1892	57°·0	12·5	78 %	2·07
1893	60°·4	10·7	74 %	4·95
1894	57°·8	9·0	78 %	1·55
1895	60°·4	11·2	77 %	4·17
1896	58°·5	9·7	76 %	2·93
1897	58°·9	9·7	73 %	6·01
1898	60°·1	6·1	74 %	6·00
Mean	**58°·7**	**9·5**	**75 %**	**3·13**
1899	60°·8	7·7	75 %	6·96

In the year 1899, as has been already mentioned under the section dealing with statistics, the death-rate reckoned on the entire population was 2·05 per 1,000, a death-rate closely approaching to that of phthisis. Nor is this the only point of approximation. Like phthisis the lower the stratum of society the higher is the mortality from this disease. Both are eminently favoured by dirty and negligent habits in the home. This has been very prominently brought forward by the inquiries of the Medical Officer of Health for Liverpool, who states that he has found a general tendency to the recurrence of fatal diarrhœa in the same families, and that these families are generally characterised by squalor and neglect.

For such a mortality as that prevailing during the last three years we have to go back to the years 1871 and 1872, before the passing of the Public Health Act, 1875.

The question, then, which we have to ask ourselves is whether this mortality is preventable at a reasonable expense and what steps should be taken to cope with it.

In order to answer this question we must, at least approximately, ascertain what are the factors at work in its causation, and of these what are removable, what irremovable.

There is no doubt whatever that the disease is most prevalent in dry and warm seasons, and that, *cæteris paribus*, it prevails most in those towns having a high mean temperature in the Third Quarter of the year and a low rainfall at the same season. I have shown that there appears to be a nexus between the first uprush of fatal cases and the occurrence of rainfall about a fortnight before, preceded and followed by warm, dry weather. The application is obvious, and has been made both in Manchester and in Liverpool in the flushing of passages and courts in dry, warm weather. In the year 1892 the Medical Officer of Health for Leeds, looking at the question of the removal of filth from another point of view, had a district, about one-tenth of the area of the city, specially scavenged so as to ensure the complete removal of all filth, and he states that this was the only district in which the death-rate from summer diarrhœa in that year did not exceed the rate for 1891.

Dr. Ballard, of the Local Government Board, in the course of his classical investigation on this subject, had recourse to Dr. Hope, then Assistant Medical Officer to the City of Liverpool, who made a personal investigation into a large number of cases of diarrhœa, and arrived at the conclusion that the incidence of fatal diarrhœa on breast-fed infants is comparatively slight, being fifteen times more fatal to artificially-fed infants under three months of age than to breast-fed infants at the same age. The calculations of your Medical Officer of Health show that in Manchester the disparity is even greater than this.

In this fact seems to lie the solution of the question how to attack the fatality from this special cause.

Great efforts have been made to determine the specific germ to which Summer diarrhœa must be ascribed. A special germ has been selected by Dr. Klein, of wide-spread prevalence—the so called spore-bearing bacillus enteridis, which occurs abundantly in horse dung—and one medical officer of health has gone so far as to ascribe the prevalence of Summer diarrhœa in London to the large quantities of horse dung in the streets. If the bacillus enteritidis sporogenes is the cause of the disease, this view cannot be summarily rejected. But London, which is certainly exceptionally rich in horse dung, is not exceptionally visited by Summer diarrhœa. Moreover, this disease has a habit of visiting, with great severity, small streets and courts which are particularly free from this material. It is, at present, best to assume that the germ causing the disease has not been conclusively settled, and it is not even determined whether there are not at work a variety of germs.

What, however, is quite certain is that the material by which the particular germ or germs is introduced is, generally, if not always, food stuff of some kind other than milk from the breast. Where breast milk appears to have given rise to summer diarrhœa, it is probable that the infant has from neglect put into its mouth filth from some source or another. Here, then, we seem to have some sort of guide to a practicable means of prevention. It seems to follow that if the milk or other artificial food taken by the infant is boiled or otherwise sterilised that the infant will generally escape summer diarrhœa.

In this city instructions have been sent to every house as to the feeding of infants, and the district registrars have been good enough to hand these instructions to all mothers registering the birth of infants. They have been founded on highly expert opinion and have prescribed minutely how to proceed and what feeding bottle to use. Yet there has been an actual increase in deaths from diarrhœa in 1899.

These results have roused suspicion and our inquiries have seemed to show that in a number of cases in which the milk had been boiled summer diarrhœa had occurred.

We are, therefore, conducted to this question. When milk has once become contaminated, does boiling suffice to prevent an attack of diarrhœa? It must be conceded that this is doubtful. On the other hand, after boiling, the germs are probably destroyed, and the question arises whether the chemical poisons remaining in the milk are sufficient to set up fatal diarrhœa of themselves. This was a difficulty which Dr. Ballard felt during his inquiries and it is one which our experience in Manchester has emphasised.

The duration and course of the disease show that germs are multiplying in the system. If these are introduced into the system with the food, then sterilisation and even boiling are not always effectual to prevent their introduction, either owing to the insufficiency of the process adopted or to the subsequent introduction of contamination into the food.

It may be, however, that germs such as the bacillus coli communis, normally present in the bowel, are able, after the intestines have been injured by the action of poisons, previously generated in the sterilised or boiled milk, to take on injurious properties, and, so to speak, carry forward the disease to a fatal issue.

We have still some further facts to guide us. Summer diarrhœa has a comparatively slight prevalence in rural districts, due, no doubt, to the inhabitants generally getting milk which is comparatively fresh. This may help to explain the small diarrhœa death-rates in towns such as Oldham, Halifax, and Huddersfield, in which the milk is brought from surrounding farms, often, by the way, grossly insanitary. The milk supply in towns must be carefully investigated before coming to a conclusion as to the causes of the disease.

Professor Delépine, in his investigations on milks brought into Manchester, has found that in summer a number of milks have produced on inoculation into guinea-pigs fatal results, the results depending apparently on the delay in delivery, and that town-produced milks carried directly to the laboratory have no such effect.

It is thus evident that the time during which milk has been kept before delivery is an important element.

There have been various efforts to cope with the difficulty of contamination of the milk supply. These may be resolved into the following groups :—

(A) It is assumed that summer diarrhœa in infants is a disease set up by germs introduced into the system with milk, and an effort has been made to get the public to take all necessary precautions in the way of boiling milk, using a proper form of bottle, &c. (Manchester.)

These efforts have not been successful in warding off a high fatality, so far as summer diarrhœa is concerned.

(B) The plan has been adopted in St. Helens by the Sanitary Authority of supplying humanised sterilised milk at cost price at public stations. This is founded on experiments of the same kind which have been carried out in Normandy, the result of private enterprise.

The St. Helens plan has been also taken up in Liverpool.

The Medical Officer of Health for St. Helens claims that this policy has already resulted in a reduction of the deaths from summer diarrhœa, under one year of age, and this seems likely to be, to some extent, the case over the area affected by these operations, especially if an effort is made to secure the milk at a comparatively early period after milking.

(c) A third plan is that of the Copenhagen Milk Supply Association, under the able guidance of Mr. Busck. On this plan the milk is kept cool by means of ice from the time it leaves the cow until it reaches the consumer, thus approximating the food conditions to those of winter.

Precautions are also taken to protect the milk from any danger of tuberculous infection, and from any unpleasant taste.

A company has been founded in Manchester with these objects in view, and the experiments of Professor Delépine show that, if the policy of the company is adequately carried out, the results will bear a favourable comparison with the policy of sterilising the milk.

There remain, then, these considerations. Supposing the milk can be rendered harmless, how are we to secure that the proper form of bottle is used, that the bottle is kept properly cleansed, and that the milk when put into the bottle is free from contamination? Instruction in this matter has been given by the Manchester Sanitary Authority to the citizens, although in the results we must acknowledge ourselves disappointed.

This much we can do. Whenever milk is found dirty, with a sediment of foul material, it can be declared unwholesome and can be proved to be so.

But the question remains, should the City Council follow the example of St. Helens and establish stations for sterilised milk?

There is also the further question whether any further effectual steps can be taken, as regards the feeding of infants.

To answer these questions one must briefly carry one's mind back to a few salient points.

The great bulk of the deaths occur in children under one year of age. In 1899 out of 1121 deaths, 840 were in children under one year. Of the 840 infants who died, 474 were under the age of six months.

The great majority of these deaths occur in the third quarter of the year. Thus in 1899 out of 1121 deaths, 948 were in the third quarter.

As has already been mentioned every parent recording the birth of a child receives a paper of instructions in infant feeding. But it is probable that long before the diarrhœa season is reached many even of those who carefully read the instructions when they received them have forgotten all about them.

The first proposal, therefore, which your Medical Officer of Health makes is that you will cause to be issued, just at the period when summer diarrhœa begins to be prevalent, to every parent having a living child born within the previous 12 months a paper of instructions as to the measures of cleanliness and methods of feeding required.

The second proposal is that you will take into your consideration the advisability of establishing in the worst quarters of the city stations for the sale at cost price of a day's supply of sterilised humanised milk. In St. Helens the price of a day's supply is about 2d. Even if this were only done in one district, it would give an opportunity of testing the value of the proceeding.

The third proposal is one which can easily be carried out, viz., that the instructions at present given by the health visitors should be systematised so as to bring a considerable force of instruction to bear on mothers of infants at the most dangerous period of the year.

The fourth proposal is to invite the school authorities to instruct the teachers of the older children in elementary schools to give them a week's instruction in the best form of feeding bottles, the methods of keeping them clean, the sterilisation of milk at home, the precautions necessary in keeping milk, and the tendance required to keep infants from taking dirty matters into their mouth.

Supposing these additional measures carried out, from what direction may we expect defeat?

We may safely reckon on a large amount of gross neglect from drunkenness and sheer inertia. Then, again, many mothers go to work and leave their children in the hands of others often unfitted to look after them. It has been said that mothers should be required to look after their children, and that legislation should be obtained preventing them from returning to work after the birth of a child for at least six months. Such legislation would, if practicable, be good for both mother and child. The difficulty is that after that or the shorter period of three months the mother would not be able to get her job again.

Not only is a measure of defeat to be looked for from this cause, but under certain circumstances it is extremely difficult to prevent milk from becoming contaminated.

If the soil is extensively polluted in the neighbourhood of dwellings from middens, from leaking, defective, or overfull pails, or from deposits of horse manure, the atmosphere may get so full of the germs which are capable of setting up diarrhœa that in warm weather the milk, even that which has been sterilised a few hours before, unless very carefully protected, will be rendered capable of setting up diarrhœa. In the ordinary course of domestic life this is almost certain to occur.

Then again, a certain amount of failure will arise from the inability of mothers to comprehend the need for some of the precautions required, with consequent failure in their execution.

Nevertheless the main solution of the problem lies, in the opinion of your Medical Officer of Health, in the regulation of infant feeding.

On the other hand, as we have seen, many failures must occur in keeping milk from becoming contaminated, and it is necessary to inquire how milk does become contaminated

There are two chief sources. One is the introduction of dirt into the milk at the farm or before delivery. That this is a considerable element is shown by the escape of country children often under conditions by no means unfavourable to contamination. The milk is comparatively fresh. That it is not the sole element is shown by the great diversity of incidence on towns.

Another powerful factor is the methods of collecting excreta and refuse. It has been shown that, taking one town with another, the incidence of summer diarrhœa is far greater on privy-midden towns than on water-closeted towns.

It is nearer to the essential fact, however, to say generally that summer diarrhœa increases with the pollution of the soil whether from middens, pails, tips, collections of animal manure on the ground, or other animal and vegetable refuse. And, in the same terms, it may be affirmed that the death-rate from summer diarrhœa declines as the methods of removing excreta and refuse, and as the methods of protecting the soil, improve.

As regards ensuring the cleanliness of milk coming from outside the city it may be stated roundly that we have no power, unless indeed it may be that we can seize milk with a dirty sediment as unfit for the food of man.

As regards the protection of the soil of the city much remains to be done. Nor does this concern only the death-rate from summer diarrhœa; but other forms of disease, such as enteric fever, scarlet fever, septic affections, and probably bronchitis and pneumonia are intimately concerned.

There are many important questions which present themselves in connection with diarrhœa, but in the above observations I have preferred to place before you only such points as seemed necessary to elucidate the practical outcome of the researches which have been made up to the present time.

On referring to the tables relating to summer diarrhœa, it will be seen that the number of deaths per 1,000 births is greatest in the Bradford district, then in West Gorton, and after these in Ancoats; then, in rapidly diminishing order, in St. George's and next in Harpurhey. Next come in order the Central District, Clayton, and Openshaw.

If we take the average of the three years 1896-98, we find that the order is not exactly the same. In those years the highest death-rate from diarrhœa per 1,000 births was, in descending order, in the Central District, in Ancoats, then in Bradford, then in Clayton, then in West Gorton and Openshaw, and then in St. George's.

In former reports I have given reasons for singling out the Bradford and West Gorton districts as specially calling for sanitary inspection, and attention has been particularly directed to the fact that these are midden districts with a high proportion of middens against the houses.

It has been stated that the number of cases of fatal summer diarrhœa is in relation to the mean temperature of the atmosphere, and to the smallness of the rainfall.

I have, therefore, put together the facts for the third quarter of the last ten years, which are as follows:—

Mean temperature in the third quarter of

1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
58°·8	59°·3	57°·3	60°·4	57°·8	60°·4	58°·5	58°·9	60°·1	60°·8

Amount of rainfall in the third quarter of the above in inches:—

8·103	12·788	12·492	10·690	9·021	11·167	9·733	9·697	6·055	7·720

Number of deaths from summer diarrhœa in the third quarter:—

247	217	275	688	212	574	391	803	807	948

It will be seen that high as our recent mortality has been some consolation is derivable from a study of the meteorological conditions, since the third quarters of 1898 and 1899 have been marked by an excessively high mean temperature and an excessively low rainfall.

This mitigation does not apply to 1897, however, in which year the rainfall was moderate and the mean temperature not excessively high. But a comparison of 1896 and 1897, in which the mean temperature and the rainfall differed but little, shows that with similar totality of these factors the number of deaths may be widely different. Other indications of the same kind are to be found in this table.

In discussing enteric fever, in the report for 1898, I have shown how the distribution of rainfall on an ascending thermometer affects the incidence of diarrhœa.

In fact if we could forecast the weather we could pretty well tell how diarrhœa would behave.

It is not merely a question of amount, but the distribution of rainfall and its relation to temperature are important.

Thus in 1893 and 1895, when the mean rainfall in the third quarter was considerable, the mean temperature being high, summer diarrhœa attained considerable heights, although not those reached in 1898 and 1899.

An important question in connection with the cleansing of the soil, with scavenging, and the structure of yards, is whether the effect which pollution of the soil undoubtedly exercises is superficial or deep. If superficial and immediate, then special efforts to scavenge the streets and to cleanse the streets, yards, and passages should exercise a very great effect.

Now, for several years, every death recorded as from summer diarrhœa is followed by a visit to the house by a sanitary inspector, who records a number of particulars.

Amongst others is the date of commencement of illness.

One of the difficulties of tracing any connection between deaths from summer diarrhœa and conditions of weather is that death occurs at so variable a period after the commencement of an attack as to make any clear conclusion difficult.

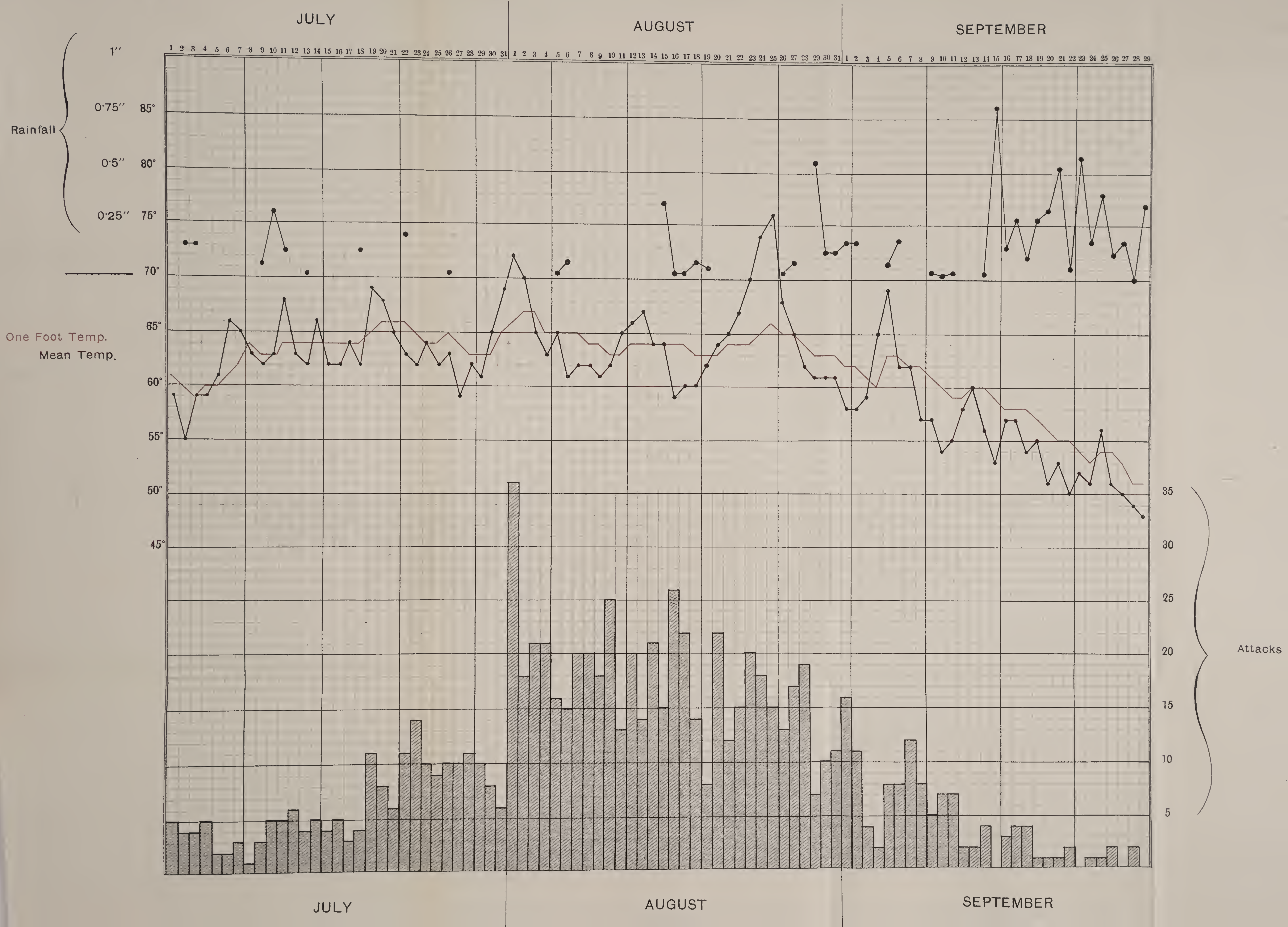
But, when the date of commencement of illness is substituted for the date of death, it may be hoped that some conclusion is attainable.

When the curve showing the number of deaths occurring day by day is plotted out, and the corresponding curve of fatal cases according to the date of commencement of the illness, the features of the two are so widely different that it is at once seen that the former is useless for our purpose. It is, therefore, not reproduced.

The diagram showing the number of attacks of fatal cases, at their commencement, day by day is accompanied by the curve of daily mean temperature of the atmosphere, and by the curve of the 1-foot earth thermometer.

1899.

DATES OF ATTACKS OF FATAL CASES OF DIARRHŒA



Also the curve of daily rainfall is given as a series of large dots, connected by lines only when rain falls on two successive days.

We may now proceed to examine the chart.

Evidently there is an uprush of fatal attacks on the 19th of July, which is fairly well sustained up to the 1st of August, when a second uprush of fatal attacks also occurs, also sustained up to the end of the month.

In appraising the influence of temperature and rainfall on the number of fatal attacks, it is necessary to bear in mind that towards the middle of August already so many will have been attacked that we must not expect the same reaction in point of numbers to occur, as would have been observable had the same factors been operative at an earlier period of the outbreak. In fact the later the stage of the outbreak which we have reached, the less shall we be able easily to draw any inferences.

This being premised, the first thing we note is that low as the total rainfall in this quarter was, viz.:—7·720 inches, of these 4·329 inches fell after September 10th, when the outbreak was practically over, so that only 3·4 inches fell from the 1st July up to the period beyond the end of the outbreak. The year was thus, so far as diarrhœa is concerned, not only phenomenally warm, it was also phenomenally dry.

If now we fix our attention on the curve of mean atmospheric temperature, and on the curve of the 1-foot earth thermometer, we perceive that their indications are nearly coincident in point of time. The peaks and hollows of the curve of temperatures given by the 1-foot earth thermometer follow those of the curve of mean daily temperature at an interval of a day, at most of two days.

The first uprush in fatal diarrhœa on July 19th follows the rise of mean atmospheric temperature at an interval of one day, and coincides with the rise of the 1-foot earth thermometer.

The second uprush on August 1st coincides with the peak of the mean atmospheric temperature curve, and follows the first decided rise at an interval of two days. It follows the 1-foot earth thermometer rise at an interval of one day, and precedes its highest point by one day.

There is, therefore, a strong presumption that an uprush of fatal summer diarrhœa is in immediate relationship with the atmospheric temperature, and that the influence of soil is entirely superficial.

If we assume a relationship between the rainfall of the 9th, 10th, and 11th of July, and the subsequent occurrence of fatal attacks, the interval would be 8 days, and the second interval between the rainfall on July 22nd, and the uprush on August 1st, would be 10 days.

Probably, however, the relationship is somewhat involved, and besides the impulse to bacterial growth attending rainfall contains two factors, one being the cooling influence exerted on the soil by the vaporisation of the rainfall, and the second being the influence of rainfall in preventing the movement of infectious dust.

We are thus led to consider another meteorological condition, namely, the movement of the atmosphere.

When we look up the movement of the atmosphere for a day or two preceding both the 19th of July and the 1st of August, we find that on both occasions it was comparatively still.

We thus arrive at the provisional conclusion that diarrhœa is liable to occur in a sudden uprush, with an ascending temperature in still dry weather, when the 1-foot thermometer records a temperature exceeding 63° Fahr., and we are led to think that it is the superficial layers of the soil or, perhaps even more, collections of filth on the surface, which are concerned in its propagation.

On this view the readings of the 4-foot earth thermometer are valuable, solely on account of the steady manner in which they rise, and as indicating the sum of the impacts of the waves of heat, rather than as marks of causative processes in the deeper layers of the soil.

The connection with what I have called a critical rainfall for enteric fever may or may not exist for summer diarrhœa, but one year's observations are insufficient to establish it.

These considerations give greatly increased weight to all suitable means taken to protect food stuffs from contamination in warm weather, especially milk.

Amongst such means is to be reckoned very great care in cleansing the soil.

P.S.—The measures recommended above for protecting the food of infants at the commencement of the diarrhœal season have been approved by the Sanitary Committee, and will come fully into operation next year.

No conclusion has been arrived at as to the establishment of stations for humanised sterilised milk.

THE NOTIFICATION OF PHTHISIS.

In the Annual Report for 1898 was inserted a report, which had been approved by the City Council, recommending the adoption of a voluntary system of notification of phthisis.

It is unnecessary to recapitulate the reasons which were there given for this important step. The course of action which has been pursued is that recommended in the report presented to the City Council by the Sanitary Committee, and the first step was to appoint a qualified medical man to assist the Medical Officer of Health. The Committee were happy in their choice of Dr. Coates, who has devoted himself to the work with persistence and ability.

In commencing a work which concerns so large a section of the community, and touches so many relations, it was considered desirable at first to limit the number of cases dealt with, so that it might be possible to eliminate errors, meet difficulties, and establish administrative methods.

The Committee, therefore, recommended that only the cases attending public institutions should at first be notified to the Public Health Office.

The public institutions concerned were :—

The Consumption Hospital, the Royal Infirmary, the Ancoats Hospital, the Clinical Hospital, the Hulme Dispensary, the Chorlton-upon-Medlock Dispensary, the Medical Mission, Angel Meadow, and the Workhouse Hospitals.

The visitors of the Ladies' Health Society were also requested at the commencement of notification to notify cases of phthisis coming to their knowledge.

At the outset, cases came in very slowly, a circumstance not wholly to be regretted, as it gave time for a consideration of the special points which arise in administration.

In determining on the line of action to be adopted account was taken of these circumstances.

1. By Cornet's researches it was shown that by far the most important factor in preventing the transmission of tuberculosis is cleanliness.

It is generally accepted that if such personal precautions are taken as will prevent sputum and other discharges from consumptive persons from being dried and subsequently dispersed as dust, the consumptive ceases to be a source of danger.

It was, therefore, part of Dr. Coates' duties to see that patients were made acquainted with the personal precautions which they ought to take. In this we have simply followed a course of action systematically pursued by the medical officers of the Consumption Hospital. Instruction was also imparted to other members of the household.

After some time it became apparent that Dr. Coates could overtake the notifications thus sent in, and it seemed possible to extend the scheme by calling on private practitioners to notify their cases. This was accordingly done on February 3rd, 1900. It soon followed that the increased work could not be carried on without an additional medical assistant, and the Sanitary Committee determined to make an appointment. This was done on May 7th, when Dr. McCleary, Assistant Medical Officer to Huddersfield, was appointed. He entered on his duties on May 21st of this year. Dr. McCleary's investigations and inspections will not be mentioned in this report, as too short a period has elapsed since his appointment, but I feel confident that he will do valuable service in gaining the public to take the precautions necessary in a pleasant spirit, and by the inquiries which he will take up.

To return to the work falling on Dr. Coates, not only is it necessary to guard against the creation of new sources of infection, but those which already exist require to be removed. For this reason the disinfection of houses and of clothing necessarily occupied much attention.

In order that it might be possible to get measures of disinfection adequately carried out it was found necessary to vary our modes of procedure, so that your Medical Officer of Health arrived at the broad distinctions given in Dr. Coates' report.

One of the methods mentioned in that report is cleaning down the walls with dough; it being understood, of course, that other parts of the room are thoroughly cleansed by other means. This is a well-known way of restoring the freshness of wall paper, but to Esmarch it occurred that bacteria could thereby be removed, an idea which he confirmed by actual trial. This method is only applicable to unsoiled walls.

This, along with other procedures which we have adopted, is at present being investigated by Dr. Coates, under the direction of Professor Delépine, and the results will be reported upon in due course.

The material actually employed by Esmarch was crumb of bread, but there seems no reason to doubt that dough will be equally efficacious.

The houses having been cleansed by one or other means, it then became desirable to have them revisited to see that the necessary measures of cleanliness were kept up.

This was effected by a visit from the health visitor once a fortnight. More recently, since notifications have been received from private practitioners, the services of the sanitary inspectors have been called into requisition.

So long as these cases were confined to the more central parts of the city, this answered very well. But, with the extension of notification, these subsequent visits have not been fully maintained. It has been found desirable to extend the interval of the visits to one month, a special paper of suggestions to consumptive persons being sent instead at the intervening period.

Without going into further detail it may be said that much has been effected in the way of removing infection from the homes of consumptives.

The importance of carrying out effective measures of house cleansing is emphasised by the experience of the New York Health Authorities. When the cases reported to the Health Office of that city were mapped out for three successive years it was found that they assumed a remarkable distribution, marked especially by this feature, that now here, now there, a continuous row of houses proved to be affected, while not far away a row would be spared. In fact the maps suggest that a house invaded by phthisis is infective to the next house, and no doubt such is the case. In the processes of removing dust, shaking carpets, and so forth, from an affected house, probably the air becomes sufficiently impregnated with tuberculous dust to infect persons in an adjacent dwelling.

2. It is still of much interest to establish the modes in which infection is conveyed, both for purposes of prevention, and in order to assist in bringing home the danger to the minds of people.

If a slight exposure to infection were sufficient to set up tuberculosis such an inquiry would be hopeless. But this does not appear to be the case. It would seem from previous observations that to most people a constitution weakened, either permanently or temporarily, or an injury, and, in addition, prolonged exposure to infection are required.

An inquiry form was drawn up by your Medical Officer of Health, embodying the results of his previous experience, which is filled up, when practicable, for each case.

The summary which Dr. Coates gives thus becomes valuable, and will be more so when his observations are extended. The class of patients with whom he had at first to do were in a great measure unable to furnish him with much information. When cases reported by private practitioners are looked into the evidence of infection becomes much stronger. It should also be stated that the amount of work to be done has hitherto not permitted of his carrying his inquiries into workshops and factories, and that no doubt much further information in relation to the transmission of tuberculosis is to be obtained from that source.

3. The inquiry form deals with the adjuvant influences at work other than infection, but no summary is yet possible.

4. Amongst the important practical points to be considered is the means by which infective discharges may be safely carried by persons travelling or engaged in work which does not permit of these being at once burned.

On general grounds handkerchiefs of Japanese paper appear the best for the purpose. But it remains to be seen whether a paper handkerchief of suitable thickness can be obtained, whether sufficient dexterity can be attained in their use, and whether the handkerchiefs after use can be rolled up so as not to infect the clothing.

These points Dr. McCleary is at present engaged in determining. If possible the solution of this difficulty should take the form of some material to be used only once.

5. As regards public measures of instruction, in addition to the leaflet which has been thrice sent to every house in the city, notices with respect to spitting have been suspended in the common lodging houses, tramcars, public houses, and workshops of the city.

With regard to public houses, your Medical Officer of Health was led by statistical facts as well as by general observation to conclude that these were associated with the spread of phthisis, and two of Dr. Coates' cases have special reference to this danger.

In respect of workshops, the Chairman of the Sanitary Committee specially requested that a letter of explanation should be sent along with the notice, so as to obviate any unpleasantness.

This was done, and in no instance has any difficulty arisen.

By the instructions of the Committee a communication is being sent to the Managers of Railway Companies, requesting them to take a similar action in smoking and other carriages.

6. An important investigation is being carried out by Dr. Coates, under the direction of Professor Delépine, on the extent to which dwellings are actually infected by the presence of consumptives.

Results more than confirming Cornet's work have already been arrived at, but this work is both slow and laborious, and a report will not be forthcoming for some time.

The time has not yet arrived when a full account can be given of the work being carried out, but I requested Dr. Coates to draw up a short statement as to the cases which had been visited, and this statement is herewith given.

The procedure adopted is summarised in his report.

Public Health Office,
Town Hall, Manchester.

NOTIFICATION OF PHTHISIS.

Dr. Niven,
Medical Officer of Health,

Sir,

I beg to present to you a report on the work carried out under your instructions from September 11th, 1899, to December 31st, 1899. I have divided the report into two parts:—

I. A report on the Administrative work.

II. A report on the investigation of facts concerned in the Aetiology of Phthisis.

I. ADMINISTRATION.

On September 6th, 1899, the medical men connected with Public Institutions at which cases of phthisis are treated were invited to notify to the Medical Officer of Health any cases of phthisis among their patients, and in response to this request, notifications were received from the various hospitals, dispensaries, and workhouse hospitals in the city.

The visitors of the Ladies' Health Society also notified any cases of phthisis they discovered in the course of their daily visits to the homes of the poor.

The notification certificates from medical men are paid for at the same rate as certificates notifying other infectious disease—*i.e.*, 1/- for each case notified from a public institution.

This involves keeping a ledger account for each medical man notifying cases of phthisis, and these accounts are balanced quarterly.

Each notification certificate is filed and indexed, and the particulars are transferred to "investigation forms," which are then handed to me.

As soon as practicable the patient is visited at home, with the following objects in view:—

(1) To obtain a history of the illness, and especially to trace the source of infection, and to investigate any conditions in the patient's surroundings which have any bearing on his illness.

The result of these investigations is given in the second part of this report.

(2) To instruct the patient and the rest of the household as to the precautions to be taken to prevent the spread of infection.

As a result, doubtless, of the educational processes which have been going on in Manchester for some years past, I found that a considerable number of the people visited have a fair knowledge of the precautions which ought to be taken, and that in many instances the patients conscientiously carry out these precautions.

But in very many cases—particularly in the poorer districts—the greatest ignorance prevails, and others who are not completely ignorant are too careless to carry out the necessary precautions, and therefore scatter infection right and left.

It is not always easy to impress these people with the seriousness of the case, but by pointing out the danger, both to the patient himself, and to those with whom he is living, and describing the requisite measures for destroying the infective material, they are eventually brought to see that these precautions are necessary for self protection, and promise to observe them.

These patients are subsequently visited every fortnight by a female health visitor or by a sanitary inspector, who reports after each visit on a special printed form whether or not these precautions against the spread of infection are being carried out, and also as to the cleanliness of the house.

Although there have been a few backsliders, the great majority are favourably reported on.

(3) The third object of my visit to the house is to determine what measures of disinfection are required for the protection of the inmates.

The nature of the disinfection required varies with the condition of the house as regards cleanliness, and with the habits of the patient, as to whether he has or has not been attending to the directions as to the disposal of sputum, &c.

In the case of dirty houses, a letter is sent to the owner of the property, or to his agent, stating that there is a case of consumption at this address, that the house is dirty, that the Medical Officer of Health is of opinion that disinfection is necessary for the protection of the health of the inmates, and asking for his consent to this being done by the Corporation at the public expense.

Although the subsequent redecoration entails considerable expense on the property owners, they readily consent to this disinfection being done.

The method of disinfection carried out is as follows:—

The wall paper (being first thoroughly wetted) is stripped from the walls, and the walls, floors, ceilings, and those articles of furniture which admit of it, are well washed with a solution of chlorinated lime, 1½oz. to the gallon.

When the patient is nursed at home milk of lime solution is used, as the patient could not tolerate the application of solution of chloride of lime.

The tenant is required to thoroughly wash the bedding, clothing, &c., and when possible, these are removed to the Corporation disinfecting station and disinfected by means of steam.

As a rule, however, the people do not care to let the bedding, &c., go to Oldham Road, and one has to be satisfied by seeing that it is well washed at home.

In a few instances filthy bedding has been destroyed.

Where the house is in a fairly clean condition, but the patient has not been carrying out the proper precautions, the same method of disinfection is employed.

When a patient removes to a new address the above method of disinfection is carried out before the new tenant comes in, and so prevents the spread of phthisis by means of infected houses.

In case of death from phthisis, or after removal of the patient to the workhouse, or other hospital, the above method of disinfection is used, except where the house is quite clean, and the patient has been observing due precautions.

Where the house is clean, and the patient is taking the necessary precautions, Esmarch's method of disinfection is advised, and invariably carried out by the tenant.

Wall papers are cleaned with dough, and walls and ceilings are limewashed.

The floors are scrubbed with soap and water.

When necessary the Corporation supply sanitary lime and lend the whitewash brushes.

The tenants are also required to thoroughly wash bedding, clothing, &c.

The particular measures of disinfection which I consider necessary for each case, are written down on the "investigation forms," and written instructions are given to the female health visitor, or sanitary inspector, who supervises the disinfection, and who reports in writing the exact nature of the work which has been done. These reports are filed with the investigation forms

After the disinfection has been done cases nursed at home are visited fortnightly (the better class cases monthly) by the female health visitor, or sanitary inspector, who sees that the house is kept clean and free from dust, and that the patient is carrying out the necessary precautions.

These visits are reported to the office, and the report entered on the investigation forms.

With very few exceptions these reports are favourable.

Every three months the tenant is advised to repeat Esmarch's method, and the visitors report when this is done.

The investigation forms are filed and indexed, both as regards addresses and names of patients, and the particulars are entered in an official register of cases.

From September 11th, 1899, to December 31st, 1899, 425 cases were visited, repeated visits having to be made to many of the houses before finding the patient or his friends at home.

The following table shows the districts in which the cases occurred :—

City of Manchester	425
Manchester Township	206
North Manchester	54
South Manchester	165
Ancoats	55
Central	55
St. George's	96
Cheetham	10
Crumpsall	—
Blackley	—
Harpurhey	7
Moston	2
Newton Heath	18
Bradford	9
Beswick	7
Clayton	1
Ardwick	22
Openshaw	7
West Gorton	8
Rusholme and Kirkmanshulme	5
Chorlton-upon-Medlock	41
Hulme	82

The great preponderance of cases in the poorer central parts of the city is partly due to the fact that at this time the only sources of notifications were the public institutions, which are chiefly used by the poor, and especially the poor of the central parts of the city.

Forty-one of the cases were notified from 28 common lodging-houses: "The Rest," in Miller Street, having 7 cases; No. 114, Grosvenor Street, 5 cases; and No. 11, Angel Street, 3 cases. 25 other common lodging-houses had 1 case each.

Of the private houses visited, 1 contained 3 cases of phthisis, 15 contained 2 cases each, and the others 1 case only.

Cleansing and Disinfection.

The number of houses disinfected by the Corporation between September 11th and December 31st, 1899, was 87; in 4 others instructions for disinfection were given previous to December 31st, 1899, but the disinfection was not carried out until early in January; total, 91.

There were, therefore, 91 houses disinfected by the Corporation by the chlorinated lime method.

Twenty-three houses were cleansed and beautified by the property owners (chiefly for new tenants) without any disinfection by the Corporation.

In 97 cases the tenant carried out Esmarch's method of disinfection.

The Common Lodging-houses were all limewashed in October, in accordance with the Public Health Act, 1875, and were generally found in a clean condition. They will be limewashed again in March.

In 5 cases the owners were required to wash the floors and skirtings.

In addition a placard has been placed in every room of each common lodging-house, as follows:—

Notice as to Spitting.

Do not spit on the floors or walls. This disgusting habit causes others to take consumption.

Medical Officer of Health.

One or two of the managers doubt whether there has been any improvement in the habits of the men as regards spitting, but most of them agree that there has been a considerable improvement, and my own observation confirms this.

If all the Common Lodging-house managers would follow the example of a particular manager there would be a still greater improvement.

This man informed me that he gives his lodgers to understand that anyone spitting on the floor, &c., would be expelled, and in three or four instances he has actually turned men out of the house.

Notices calling attention to the danger of spitting about have been posted in the tramcars, and others have been distributed to all the public-houses and workshops in the city.

Isolation.

As a rule, the isolation of phthisical patients is bad. In very few instances has the patient a separate bedroom, and in most cases he has not even a separate bed.

Of the 425 cases visited, 119 were removed to the Workhouse Hospitals, and three to Mr. Crossley's "Home of Peace."

The great majority of these cases would remain in hospital until death takes place.

Seven patients went to the Bowdon Hospital for Consumptives; three patients went to the Ancoats Hospital; one patient went to the Royal Infirmary; one patient went to the Clinical Hospital; six patients went to Convalescent Homes; but in all these cases the period spent in hospital is only a very short one, and then the patient returns to his home.

There also remain many patients in the later stages of phthisis who cannot go to the special hospitals for consumptives, and who will not go into the Workhouse Hospitals.

It is difficult to be certain that all infective material is destroyed in these advanced cases, where the patient is feeble, and expectoration is profuse, and hence some further provision is required for these cases.

Deaths from Phthisis occurring in cases which have not been notified.

Houses in which a death from phthisis has taken place are visited by the sanitary inspectors, who advise the tenant as to disinfection and offer free disinfection by the Corporation.

From September to December 31st, 1899, 35 of these houses were disinfected by the Corporation.

II. INVESTIGATION OF FACTS CONCERNED IN THE AETIOLOGY OF PHTHISIS.

Of the 425 cases visited, 97 were useless for the purpose of inquiring into the modes in which infection was acquired, because no information about the patient's history was available.

Forty-one of these were inhabitants of common lodging-houses, and some of them, doubtless, acquired the disease in these houses.

The remainder of the 97 cases were chiefly patients who had gone into the Workhouse, and who had left no relative or friend who could give any information.

This leaves 328 cases in which the ordinary sources of information were available.

By far the most common manner in which infection has been acquired, is by living in the same house as a person suffering from consumption.

A.

In the following cases there was a history of prolonged and intimate exposure to infection at such a period as may have been the starting point of the disease :—

(*a*) Patients who had lived in the same house as a relative suffering from consumption—numbering 140.

Out of these the presumed source of infection was—

the father	in 38	cases
,, mother	,, 26	,,
,, sister	,, 14	,,
,, brother	,, 28	,,

The husband apparently infected the wife in 18 cases, while in only 5 cases did the wife infect the husband.

In 3 cases an uncle seemed to be the source of infection, and in 2 cases an aunt.

In only 5 cases out of 140 were parents infected from their children—3 from sons and 2 from daughters.

In 1 case the grandfather appeared to be the source of infection. It is rather curious to notice that in these cases the source of infection was a male in 91 cases and a female in only 49 cases.

(*b*) Living in the same house as a consumptive who was not a relative—9 cases.

In 9 cases phthisis seems to have been contracted from a fellow-lodger (not in Common Lodging-houses).

Case 23.—Has been ill 1½ years. For 4 years has slept in the same bedroom with a man who had phthisis.

Case 36.—Patient, for several years, slept in the same bed as a woman who died of phthisis 10 years ago. Patient has been ill 9 years.

Case 161.—Lodged with and slept in the same bed as a man who had phthisis.

Case 199.—Lived for 3 years, and up to his death, with a man who died of phthisis 15 months ago. Ill 3 to 4 years.

Case 284—Ill 5 years. Lodged for 5 years with a man who died of phthisis 5 years ago, up to his death.

Case 292.—Lodged for 4 years and up to his death with a man who died of phthisis 3 years ago. Ill 2 years.

Case 325.—Lived for 4 years with a consumptive. Gave up living with him 14 years ago. Ill 12 years.

Case 396.—Ill 1 year. Has lodged with a consumptive 1 $\frac{5}{12}$ years.

Case 108.—For 8 months, nursed up to his death a man who died of phthisis 7 years ago. Ill 5 years.

B.

The following cases, though not living in the same house, have been intimately associated with consumptives :—

(*a*) In 11 cases the patient has had intimate contact with a consumptive relative, at a period consistent with such intimacy having been the starting point of the disease.

These are cases 119, 249, 281, 309, 327, 362, 375, 383, 408, 419, 421.

(*b*) In 5 other cases an intimate friend was the apparent source of infection.

Case 17.—A year before patient's illness commenced he was assisted in carrying on a temperance mission in a small mission hall, for 3 or 4 evenings every week, by a man who had phthisis. After leaving the mission room they would go to the patient's house and sit an hour or so.

Case 190.—One year ago, a woman who lived next door to patient died of phthisis. Patient often sat hours with the woman during the last 12 months of her illness, and during the last few weeks was with her almost constantly. Patient began to "feel out of sorts" just before this woman died.

Case 299.—An intimate friend who visited patient a good deal, died of phthisis 18 months ago. Patient has been ill 2 years.

Case 305.—Previous to 2½ or 3 years ago, patient spent all her spare time with a girl who has since died of phthisis. She often slept with her for a few nights at different times. Ill three years.

Case 333.—Until three years ago patient lived in Staffordshire. Two of her companions (who worked in the pottery trade) had phthisis, and one of them has since died of phthisis. This patient has been ill three to four years.

In two instances phthisis appears to have been contracted by living in houses which had been infected by previous tenants who were consumptive.

(1) Cases 227 and 228.

The patients, man and wife, were quite healthy before living here.

Three months after coming here the husband began with a slight cough, and shortly afterwards the wife began. Both are now suffering from phthisis.

The house is damp and very dirty, and was said to be in this condition when the present tenants came into it.

The previous tenant was a consumptive, and occupied the same bedroom as the present patients. Judging by the description given of the condition of the house when the patient came into it, the previous tenant must have been of very careless and dirty habits.

No cleansing or beautifying was done between the late tenant going out and the present tenants coming in.

The period between exposure to infection and the appearance of symptoms is rather short (three months), but this is a case in which the conditions were very favourable to the infective agent.

A sample of dust was taken from the floor of this bedroom, from such a position that it could not be directly reached by the patient's expectoration, and after being rubbed up with sterilised water, was inoculated into two guinea-pigs.

One of these died within 48 hours from some acute septic affection.

The other was killed four weeks after inoculation, and found to have well-marked tuberculosis of the lymphatic glands, liver, and spleen.

(2) In the other case (No. 244) the patient was, as far as he knows, quite healthy when he came to live in this house four years ago. His illness commenced three years ago.

The previous tenant died of phthisis a few weeks before patient came to live here, and had used the same bedroom as the present patient.

The bedroom was not beautified or cleaned (as regards the walls and ceilings) until the present tenant had been here one year, when nine papers were stripped off the wall.

Possibly there are many other cases in which patients owe their illness to living in infected dwellings, but I have found it extremely difficult to get any reliable information about previous tenants owing to the migratory habits of the people.

In houses where infection is most likely to occur, *i.e.*, dirty back-to-back houses in the poorer quarters of the city, the migratory habits prevail to the greatest extent, and it is only very exceptionally that one can learn anything at all of the previous tenant.

Another very important group of cases consists of patients who have been in prolonged and intimate contact with consumptives while following their employment in the various workshops and warehouses.

In 33 cases I have obtained a history which points to such infection.

Case 21.—Says he has been ill 1 year. Worked for 4 or 5 years near a man who died of phthisis 3 years ago. (Warehouseman.)

Case 33.—Labourer at dyeworks. There have been many cases notified among the workpeople here.

Case 39.—From 1894-96 worked on the next machine to a woman who had phthisis. Illness commenced in 1896. (Machinist.)

Case 42.—For 6 years worked on the next stone to a man who had phthisis and who is now in Crumpsall with phthisis. (File Grinder.)

Case 43.—Did not know he had worked with a consumptive, but, as a matter of fact, other cases have been notified from here. (Warehouseman.)

Case 45.—Ill 5 years. Worked with a man who died of phthisis 6 years ago. (Warehouseman.)

Case 56.—Three of patient's fellow-workmen have died of phthisis and another is now in hospital with phthisis. (Rubber Works.)

Case 60.—Ill 6 years. Worked for 3 years at same press as a man who died of phthisis 7 years ago. (Warehouseman.)

Case 68.—Ill 7 years. Several of patient's fellow-workmen have died of phthisis within the last 8 years. (Warehouseman.)

Case 72.—Ill 2 years. Worked for 2 years in close contact with a man who died of phthisis 4 years ago. (Dyeworks.)

Case 74.—Case 275 also worked here, and another girl from same workshop is at Bowdon with phthisis. Several girls have left on account of ill health. (Machinist.)

Case 105.—Worked for 4 years with a girl who went to Bowdon 4 years ago with phthisis. (Machinist.) Three or four other girls in another room attend the Consumption Hospital, out-patient's department.

Case 113.—Ill 5 years. A fellow-workman died of phthisis 6 years ago. Another fellow-workman, who sat next to patient for 1½ years, left 5 years ago with phthisis. (Tailor.)

Case 140.—Ill 4 years. A fellow-workman died of phthisis 3 to 4 years ago. Several others with chronic cough. (Moulder.)

Case 148.—Ill 5 years. One of patient's fellow-workmen died of phthisis. Several others are attending the Consumptive Hospital. (Machinist.)

Case 166.—Many persons said to have phthisis both in the present and former workshops. (Clay Pipe Maker.)

Case 173.—Ill 8 months. Fellow-workman died of phthisis 3 months ago. (Felt Hat Finisher.)

Case 177.—Worked for 2 or 3 years with a man who had to leave on account of phthisis. Several others with more or less cough. (Grinder.)

Case 179.—Patient says several of his fellow-workmen suffer from phthisis, and one died of phthisis 4 years ago. (Worked in cardroom of a cotton mill.)

Case 182.—Worked with a man who died of phthisis 2 years ago. Many others said to have a cough. (Fur Cape Maker.) This patient also has a family history of phthisis; his brother died of phthisis 4 years ago.

Case 189—Remembers three who have left on account of cough and weakness, and 1 has since died. (Warehouseman.)

Case 204.—Ill one year. Worked with case 203, who has had phthisis 5 years. (Slipper Riveter.)

Case 213.—Workfellow died of phthisis 3 years ago. Two others are attending the Consumption Hospital. Ill 4 years. (Warehouseman.)

Case 226.—Ill 2 years. Fellow-workmen left on account of phthisis 8 years ago. Several others with a bad cough and spit. (Warehouseman.)

Case 265.—Patient says that five girls and three men have died of phthisis since she worked here. (Bookbinder.) Cases 185, 269, and 294 also worked here, but not all in the same room.

Case 269.—Worked same room as 265. (Envelope Maker.)

Case 275.—See 74.

Case 306.—Ill 2 years. 8 or 9 years ago three of the girls who worked with patient died of phthisis. Patient has not worked for 8 years. (Cap Maker.)

Case 318.—Many fellow-workmen have "bad chests," 3 said to be away with phthisis. Two have died from phthisis since patient began to work here, and another one is said to be at home very ill with phthisis. (Warehouseman.)

Case 319.—Has worked with many consumptives, and knows several who have died. Workmen spit anywhere about the floor. (Warehouseman.)

Case 330.—Three girls who worked near patient had phthisis, and one has died since patient left. They spat about the floor. (Machinist.)

Case 381.—Worked at the same dyeworks as case 33. Several cases here. (Dyeworks.)

Case 385.—Patient has worked with several consumptives. (Stonemason.)

Case 403.—Three of patient's fellow workmen said to have phthisis. (Moulder.)

In six other cases, although there was no definite history of a fellow-workman having had phthisis, the patient could tell of some of his fellow-workmen who suffered from a chronic cough, or bad chest, and no doubt some of these were consumptive :—

Case 5.—Worked for four years under a foreman who had a "bad chest." Patient ceased to work under this foreman three years ago, and began to be ill about three years ago. (Cloth Finisher.)

Case 30.—Six years ago patient worked with a man who had a bad cough, and spit, and who was thin. Patient has been ill five years.

Case 34.—Many fellow-workmen have bad cough and spit. (Dry Grinder.)

Case 154.—Has worked with several who had a chronic cough, and spit, but does not think they had phthisis. Patient did not know *he* had phthisis. (Tailor.)

Case 157.—Some of fellow-workmen had chronic coughs. Patient does not think they had phthisis. (Warehouseman.)

Case 377.—Has worked with many "bad chests." (Finisher.) This patient also has a family history. His father died of phthisis 17 years ago. Patient has been ill nine years.

In many other cases such exposure must be unconscious (because the disease has not been recognised), and is therefore overlooked.

Nine of the cases in which a definite history of having worked with a consumptive was obtained were warehousemen in the grey cloth trade.

In the handling of this cloth a good deal of dust is created which consists of the sizing and China clay put in to stiffen, &c., the cloth.

It appears to be a universal habit for these warehousemen to spit on the floor, or anywhere about the warehouse, and therefore the dust in the air must be to a certain extent infected dust.

Case 365 is of interest in this connection.

The patient works in a rag and paper warehouse, where the business is to sort out and place in separate heaps the rag, paper, string, &c.

All the rags and paper are new, *i.e.*, have not been used, and come exclusively from the warehouses, and are the small pieces of cloth, string, and paper which are swept up from the floors of the warehouses.

There is a good deal of dust attending the sorting out of these rags, and in view of the large number of consumptives employed in warehouses, and the habit of spitting on the floor, much of this dust must be infectious.

There was no family history of phthisis, and no other way of accounting for the illness.

Seven of the cases infected at work were machinists (girls), and apparently these girls are no more careful about spitting on the floors, &c., than are the warehousemen.

No investigations have been made into the conditions of cleanliness, ventilation, &c., of these workshops, from lack of time.

Among the cases occurring in children, special attention has been directed to the possibility of infection from milk.

Forty children aged 10 years or younger were visited, and those in which there appear to be grounds for suspecting milk infection are as follows:—

Case 64.—Aged 4 years. Has suffered many times from attacks of diarrhœa. Fed partly on condensed milk and partly on cows' milk. No family history of tuberculosis.

Case 304.—Aged 4 years. Ill 3 years. Had consumption of the bowels 3 years ago. Hand-fed—cows' milk and Angel's food. House damp. No family history of tuberculosis.

Case 364.—Aged 5 years. Ill from birth. Many attacks of diarrhœa. Fed on cows' milk.

Case 378.—Aged 10 years. Ill 6 years. Operation for tubercular peritonitis 5 years ago. Father and mother healthy, but sister died from wasting and bronchitis 7 years ago; brother died from wasting and convulsions 4 years ago; sister died from bronchitis 6 years ago. The family have had the same milk supply for many years.

The two following cases, both in the same house, have had almost constant diarrhœa from being a few weeks old and are both hand-fed. Both father and mother, however, are phthisical:—

Case 15.—Aged 6 years. Ill 5½ years. Suffered much from consumptive bowels when an infant.

Case 16.—Aged 2 years. Ill since being one month old. Also has consumption of the bowels.

In the following cases infection probably took place in a public-house:—

Case 20.—Patient spent his evenings in the tap-room of a beerhouse with a man who died of phthisis 4 years ago. Patient has been ill 3 years.

Case 75.—Patient and four or five others spent all their evenings at the same beerhouse. Three of these men have died of phthisis within the last three years, making four cases with patient. These men did not work together, and never met except at the beerhouse.

Many of these beerhouses are small and badly ventilated, and the men expectorate freely into spittoons, but chiefly on to the floor.

Three of the cases investigated were men who worked at the "driers" at Holt Town Works. These men have to scrape the inside of the "driers," and get completely covered with dust.

In the next group of cases, exposure to infection has been less intimate, or has occurred at a remote period :—

Case 3.—Two of patient's sisters said to have phthisis. Patient has not lived with them for eight years, and sees them only occasionally. Patient has been ill three years. His mother died of phthisis many years ago.

Case 169.—A commercial traveller. Has known several commercials who had phthisis, and spent an evening with them occasionally.

Case 9.—Patient is the wife. The husband (a slipper maker) worked for three years with a man who had phthisis, and who spat on the floor a great deal. The husband appears to be healthy, but he had to carry slippers home to finish them, and may have carried infectious dust in the slippers or in his clothes.

Case 54.—Four years ago patient was "tramping" for six months looking for work, and sleeping at night in common lodging-houses. He attributes his disease to this, and, considering the prevalence of phthisis in common lodging-houses, probably he is correct.

Case 22.—Ill five years. Age 35 years. Father died of phthisis 14 years ago, and brother died of phthisis 15 years ago. Patient lived with his father and brother up to their death.

Case 87.—Ill nine years. Aged 40 years. Brother died of phthisis 20 years ago, and another brother died of phthisis 16 years ago, both in the house in which patient was then and is still living.

Case 206.—Ill nine years. Aged 29 years. Father died of phthisis 19 years ago. Patient was living with his father up to his father's death.

Case 238.—Ill 2 to 3 years. Age 26 years. Brother died of phthisis 19 years ago. Two cousins died of phthisis seven and eight years ago. Patient did not live with his cousins but often saw them.

Case 239.—Ill nine years. Age 33 years. Father died of phthisis 17 years ago. Patient lived with his father until the latter died. Patient's wife died of phthisis two months ago after three years' illness, and was probably infected by patient.

Case 255.—Ill five years. Aged 13 years. Mother died of phthisis ten years ago, but not in this house. Patient was living with her mother until the latter died.

Case 50.—Aged eleven years. Ill three years. Father died of phthisis eleven years ago. Another girl of same age, attending same school, has had phthisis eight years, and may have infected this patient.

This leaves 98 cases in which no history of exposure to infection could be obtained and in which there was no family history of phthisis.

Forty-five of these were living in insanitary houses, the insanitary conditions being dirt, damp, bad lighting, and defective drains.

Fourteen of the houses (in these 78 cases) were back-to-back.

Out of these 78 patients, 48 were narrow chested.

In 17 cases (of the 78) some other chest affection had probably been a predisposing cause.

Measles and Bronchitis	4
Pneumonia	6
Influenza and Bronchitis	7

One case (289) had been ill 1 year and had spent the last 2 years of his life in common lodging-houses.

Case 98. Lived 2 years in a very dirty and overcrowded Jewish lodging-house. (A Tailor.)

Sanitary Condition of Houses.

Of the total number of houses visited :—

Seventy-five were in a very dirty condition.

Seventy-four were damp { 44 being both damp and dirty.
30 being damp but not dirty.

Forty-two were back-to-back houses.

Five had defective drains.

Seventeen were badly lighted and ventilated.

In only one case was there considerable overcrowding.

Twenty-eight of the houses were common lodging-houses. (41 cases).

SUMMARY.

The following table summarises the results of the inquiries as to the modes of infection :—

(1) History of * infection obtained :—		
Living with a consumptive	151	
Intimate association with a consumptive though not living in the same house	16	
Living in a previously infected house	3	
Infected in workshops	37	
Infected by milk—phthisis being secondary to tuberculosis of the bowel	4	
Infected in public-houses	2	
		213
(2) Cases in which exposure to infection has been less intimate or has occurred at a more remote period than in (1).		11
(3) Doubtful :—		
Worked with cases of "chronic bronchitis," "bad chest," &c.		6
(4) Cases in which source of infection could not be traced		98
(5) Cases not investigated as regards source of infection because no information was available		97
		425

HAROLD COATES.

THE MANCHESTER MILK CLAUSES.

It appears desirable to give some account of the origin of these clauses anew, and to indicate what difficulties have arisen in working them.

The Report of the Royal Commission on Tuberculosis appeared in 1898. But prior to the evidence taken by the Royal Commission, the Corporations of Manchester and Liverpool instituted two series of observations.

The Corporation of Liverpool took a series of samples of the ordinary milk of commerce, both from internal and external sources, and submitted them to bacteriological examination.

The result was to show a surprising amount of infection in the milks coming from outside, and a very slight amount in the milks taken from cowsheds within the city. The numbers were, however, too small to conclude that this was a general relationship.

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* The term infection is used instead of probable source of infection. The term infected has the same significance.

We began our examinations in Manchester about the same time, though in a different manner. It was considered desirable to lay a basis of fact for administrative action, and it was not thought possible to take action merely on the presence of tuberculous infection in the milk.

Acting under the instructions of the Hospital Sub-committee we had the cows inside the city clinically examined, and the milks from indurated udders were submitted for examination to Professor Delépine.

Out of 10 milks so submitted, five proved to be tuberculous, and it was thus seen that the mere presence of induration was insufficient in itself without further proof of disease.

Subsequently a series of samples, 108 in number, was taken at the railway stations from milks sent into the city by farmers living outside, of which 20 proved tuberculous.

Sixteen of these farms were visited by Mr. James King, M.R.C.V.S., then chief veterinary inspector to the Corporation, and on 14 of them cows with indurated udders were discovered, showing symptoms of tuberculosis.

Unfortunately this inquiry was not pushed to its legitimate conclusion by a further examination of milks from the suspicious udders.

Sufficient, however, had been established to make it certain that at all events a considerable proportion of the tuberculous cows could be reached by taking samples of the milk sent into the city, and by following tuberculous specimens to the farm.

When, therefore, the Report of the Royal Commission on Tuberculosis was published, it was evident to the Manchester Sanitary Authority that the recommendation to confer on local authorities powers similar to those under Sections 24-27 of the Glasgow (Police Amendment Act), 1890, with power to slaughter such cows subject to compensation under the conditions named in the Report, was precisely what was wanted to enable the city to make a beginning in the protection of its citizens from the importation of tuberculous milk, and the City Council accordingly resolved to apply for similar powers. This example was followed by a number of other authorities.

Unfortunately, however, having been prominent in the investigation of the facts relating to tuberculous milk, Manchester was especially obnoxious to those who considered their interests threatened, and a special effort was made to throw out the clauses at the ratepayers' meeting. This effort failed, but the clauses were crippled by the exclusion of clinical tuberculosis, and the limitation of procedure to disease of the udder.

When the crippled clauses came before Parliament there seemed a danger that they would be thrown out altogether, and the Local Government Board, being of opinion that legislation was needed, made suggestions for a set of new milk clauses which all the authorities applying might adopt. These ultimately became law again with the aid of the Local Government Board, while to Manchester fell the honour of having the clauses first discussed before the Police and Sanitary Committee. These common milk clauses in some respects are an advance on those put forward by the Corporation, and certainly give very large powers. But so far the Manchester Corporation have not thought it necessary to use the larger powers contained in them.

They have been content to deal only with the individual cows discovered by the process mentioned, and to see that these are removed from the farms supplying Manchester. So far as this city is concerned, there is no question that a great improvement has been effected both within and without the city.

On October 2nd the Sanitary Committee appointed Mr. J. S. Lloyd, veterinary surgeon to the Burnley Corporation, to act as veterinary surgeon under the clauses, and to deal with cowsheds, under the supervision of the Medical Officer of Health, and on November 20th Mr. Lloyd entered upon his duties.

Mr. Lloyd had a distinguished career as a student, and since his appointment has shown marked ability in the manner in which he has taken up his new work.

The principal work which has devolved upon him has been—

1. To inspect systematically the Manchester cowsheds, with a view to bringing them into line with the regulations.

The policy which we have evolved has been to make specifications on lines already given in the Annual Report for 1898, with plans showing the manner in which the farm buildings should be constructed so as to comply with the regulations in the most approved manner.

On these lines, however, although six cowsheds had been closed in the city, only three were reconstructed or in process of reconstruction.

The specifications and plans had been previously prepared by Inspector Hyslop, of the Sanitary Department, on lines laid down, in each case, by the Medical Officer of Health.

This work would have necessarily been very slow had Mr. Lloyd not been appointed. He has, however, taken it up, and displayed considerable ingenuity in devising modes by which farm buildings may be altered so as to give modern requirements at a minimum of expenditure, and it can now go on in a steady manner.

These specifications are not intended as imperative requirements, but as indications of how the cowsheds can be made good, and this is clearly stated in the letter accompanying each specification.

I have requested Mr. Lloyd to report on this part of his work.

2. The Manchester milk clauses came into operation on January 11th, 1900, and no time was lost in getting to work.

Up to April 30th, 1900, 603 cows had been examined in the city cowsheds, 555 in the cowsheds around Manchester supplying the city directly by cart, and 729 outside the city. These were examined without the interposition of samples taken at the station, and resulted in the discovery of six tuberculous udders, as proved by Professor Delépine's examination of the samples of milk from the affected udders.

Up to the date mentioned 135 samples had been taken at the station, of which 12 proved tuberculous. These correspond to 12 farms, and in examining these farms tuberculous cows were discovered at five of them. At seven farms a tuberculous cow was not discovered for one or another reason.

A detailed but brief account will be given by Mr. Lloyd, showing the manner in which the tuberculous cow in each case was discovered, and the way in which it was disposed of, up to the end of April, 1900.

Certain difficulties have presented themselves in the course of carrying out the milk clauses.

A.—The first difficulty has been the discovery of the cow or cows causing the milk to be tuberculous. In a certain proportion of cases, after a milk taken at the station has been shown to be tuberculous, viz., in seven instances out of 12, no cow yielding tuberculous milk has been discovered. In five instances the tuberculous cow was discovered.

This source of failure has arisen from several causes.

(*a*) A farmer may from some cause, after the station sample has been taken, and before the result of Professor Delépine's examination has become known, dispose of any cow in his possession which he may suspect or believe to have tuberculosis of the udder.

This seems to have happened in four instances.

(*b*) In one or two instances the veterinary surgeon may have missed a cow with a diseased udder. Since these inquiries commenced it has become evident that there is a form of diffuse tuberculosis of the udder extremely difficult to detect on clinical examination, and not much affecting the consistency of the udder on handling.

Further, suppurative mastitis is liable to be tuberculous in its nature, and one such case has given tubercle bacilli.

Again, it may well happen that a discharge is taking place from a limited tuberculous deposit in the udder on one day which fails to occur when the subsequent sample is taken.

At the same time, there can be no doubt that tuberculosis of the udder, with all the aids to clinical diagnosis which the history of the illness and which a careful examination of the lymphatic glands affords, is often extremely difficult, if not impossible, of detection on clinical examination.

It is difficult to believe that the whole milk of a herd could be rendered tuberculous by bacilli entering the fluid, not from a local discharge, but by way of the lymphatics or through the bloodstream. It must be generally accepted at present that, given a tuberculous milk, some animal in the herd has got a tuberculous udder.

It seems equally clear that the ordinary methods adopted fail to detect this udder in a certain proportion of cases, even in the most skilful hands.

In such a case the following procedure may be adopted :—The herd should be tested with tuberculin, and the cows giving a local reaction in the udder should be set aside. From each affected udder a sample of milk should be taken for examination.

The udders affected in such a manner as not to yield evidence on a clinical examination might thus be made to give up their secret.

Inasmuch as the farmer will certainly be puzzled in such a case, this gives him an opportunity of getting rid of the offending cow without having his milk supply stopped, which is the only alternative, and rather a hard one.

It is evident that the search for cows affected with tuberculosis of the udder will tax to the utmost the skill and ingenuity of all the officers engaged.

B.—A difficulty arises in the disposal of the cow when discovered.

The clauses require that she shall not be kept, or be permitted to be kept, in any field, shed, or other premises along with other cows in milk, under a penalty of five pounds.

Under this section the farmer might dispose of his cow to another farmer as a dairy cow, or he might isolate and fatten the cow, or on the other hand he might have her slaughtered at once.

The first course has been somewhat apprehended by sanitary authorities, and, it appears from our results, not altogether without reason.

On the other hand, to fatten the cow for slaughter is no security against the use of the milk, unless the cow is dried as soon as possible.

The number of cases of tuberculosis of the udder in which this local incidence of the disease is associated with a small amount of general disease is so small that it is better for a farmer at once to have his cow slaughtered, and this it is that we aim to bring about.

There is no reason, if the carcase fulfils the conditions laid down by the Local Government Board, why it should not be sold for human food.

But this should not be done in a corner, nor except under expert examination, and in all cases of cows found to be suffering from tuberculosis of the udder we now inform the Medical Officer of Health for the county, and generally the District Medical Officer, besides endeavouring, usually with success, to secure the presence of Mr. Lloyd at the slaughter of the cow.

I have requested Mr. Lloyd to prepare a report of his work up to April 30th, giving a detailed account in each instance when a sample of milk has proved tuberculous, or clinical examination has seemed to show tuberculosis of the udder.

OUTLINE OF WORK DONE BY THE VETERINARY SURGEON TO THE SANITARY COMMITTEE BETWEEN THE DATES NOVEMBER 22ND, 1899, AND APRIL 30TH, 1900.

In presenting this report to the Medical Officer of Health, I beg to state that I took up the duties of my post on the 20th of November last.

From that date to January 11th my time was occupied in making a systematic inspection of some of the Manchester cowsheds, noting the defects causing non-compliance with the Manchester Regulations under the Dairies, Cowsheds, and Milkshops Orders, and preparing specifications showing one way in which the farm buildings in default can be so altered as to comply with the regulations. At the same time, the cows in these cowsheds were also examined.

The Manchester Milk Clauses came into force on January 11th, and from then to the end of April a considerable portion of my time was taken up in carrying out these clauses. Any time at my disposal other than in connection with the clauses was devoted to continuing the inspection of the cowsheds and milking cows within the city.

Manchester Regulations.

The regulations under the Dairies, Cowsheds, and Milkshops Orders were made for the following purposes :—

(*a*) For the inspection of cattle in dairies.

(*b*) For prescribing and regulating the lighting and ventilating, cleansing, drainage, and water supply of dairies and cowsheds in the occupation of persons following the trade of cowkeepers and dairymen.

(*c*) For securing the cleanliness of milk stores, milk shops, and of milk vessels used for containing milk for sale by such persons.

(*d*) For prescribing precautions to be taken by purveyors of milk and persons selling milk by retail against infection or contamination.

These regulations have been in force since the 5th day of October, 1896.

In carrying out the inspection under these regulations I have made 98 visits to 41 farms, all the latter of course being in the city. The number of cowsheds inspected has been 77, and the number of cows examined 603.

Manchester Cowsheds.

The Royal Commission on Tuberculosis, in their report issued in 1898, suggested the following conditions as being necessary to warrant the registering of a cowshed :—

1. An impervious floor.
2. A sufficient water supply for flushing purposes.
3. Proper drainage.
4. A depot for the manure at a sufficient distance from the byres.
5. A minimum cubic contents of from 600 to 800 feet for each adult beast.
6. A minimum floor space of 50 feet to each adult beast.
7. Sufficient light and ventilation.

Taking a line for the inspection of cowsheds from these suggestions, which are practically all embodied in the Manchester regulations, I have to report that in no instance were the regulations complied with in their entirety.

The lighting, ventilation, cubic contents, and superficial space allotted to each cow are in the majority of cases very deficient. Only in a very few cases is an impervious floor present, an effectual system of drainage in existence, or an adequate supply of wholesome water provided in the cowshed.

In regard to a large number of the cowsheds, however, I am pleased to state that there was a distinct attempt at cleanliness, although in a few instances greater attention to cleanliness is required, and to ensure this a frequent inspection is necessary. It is hardly necessary to add that in those cowsheds where the floors and drainage are bad, and the light and cubic contents are deficient, dirty conditions most prevail. At the majority of the farms a properly constructed middenstead is required, as it is impossible for the occupier to keep his yard clean when the manure is lying in perhaps two or three heaps in as many parts of the yard, with the liquid from the manure running over the yard in different directions.

At three farms I found improvements had been made on them in accordance with previous specifications, and at two farms new cowsheds are in process of building.

Following out the procedure previously adopted in regard to defective cowsheds, marked copies of the regulations have been sent to most of the occupiers whose premises are in default, pointing out the non-compliance with the regulations, and, in 18 cases, specifications have been sent to them showing one way by which the necessary alterations can be made to enable them to comply with the regulations.

Accompanying each specification are sketch plans showing *(a)* the arrangements of the cowsheds in default, *(b)* the alterations suggested in the specification. These plans are made by Inspector Hyslop, of the Sanitary Department.

Specifications are now being drawn up, and it is proposed to continue this work until the whole of the city cowsheds have been overtaken.

Manchester Cows.

The number of Manchester cows examined is, as already stated, 603. These cows are mostly of a cross-bred type, the dairy shorthorn being most common. They come from almost all parts of the British Isles, many coming from the North of England, the Midlands, and Wales, some from Ireland, and a few from Scotland.

I found a large number of them to be well fed and groomed, although, in some few instances, much greater attention is required in regard to feeding, cleaning, and other matters.

The most prevalent custom amongst the Manchester cowkeepers is to buy in recently calved cows at the ages of 5 or 6 years, practically when they are at their best. Many buy their cows from local cattle dealers or at the Salford Cattle Market, others go to the country fairs and buy direct from the farmers and breeders. After milking for some 6 or 8 months these cows are fattened for slaughter, sometimes being disposed of at home to butchers or dealers, at others being taken to market. Recently, owing to the scarcity and consequent high prices of beef, the butchers have been going round the cowsheds and buying up all the well-fed cows they can get.

It is only in rare instances that the cowkeeper breeds from his milking cows, as owing to having to buy a large proportion, often the whole, of the food the cows consume, it does not pay to keep cows that are not in full milk. As will be seen later, only a small proportion of the cows in the city have some affection of the udder, and no doubt the above fact accounts for this immunity. There is every probability that a considerable number of the cows are more or less tuberculous, but owing to their being kept in the cowsheds for only a few months it seems as if the disease does not have time to become so far advanced as to affect the udder. Again, owing to the cowkeeper as a rule buying only cows with, as far as he can judge, normal udders, very few have udders with minor affections, the principal defect being atrophied quarters.

The food supplied to the cows is, as a rule, good and wholesome, and in most cases is sufficient. It consists usually of a combination of some of the following feeding stuffs:—Hay, indian meal, feeding cakes and meals, crushed oats, bean or pea meal, linseed or cotton cake, malt culms, brewers' grains, and roots.

Only in one or two cases did I see inferior hay being used, but in many instances bad-smelling and sour brewers' grains were being fed to the cows. This I consider very objectionable, being probably bad for the health of the cows, and it may possibly affect their milk. If only a sufficient quantity of fresh brewers' grains to last for not more than two days were obtained at one time the use of sour grains would be obviated. In no case is it advisable to store grains in the cowshed. Where roots are used, cleaning of them should be carefully attended to.

At those cowsheds where the town's water is laid on the cows have a wholesome and adequate supply, but at some of the more outlying farms better facilities for watering the cows are necessary. Where the cattle drink at ponds in the fields, the ponds should be so fenced round as to prevent the cows walking into them and fouling the water by stirring up the mud at the bottom, or by contaminating the water with their own excreta. There is also danger of pollution of the water from the drainage of sewage into ditches in the vicinity of ponds or brooks, as after wet weather there is no doubt that a considerable quantity of water runs from such ditches into the brooks and ponds near, carrying with it any infective matter which may be previously lying there. Ponds are also often muddied by ducks; and where this is the case, ducks either should not be kept, or should be so fenced in as to stop them from frequenting the drinking pond.

The bedding of the cows in most cases is sawdust, although in some cases straw is used. In the interest of cleanliness the latter is desirable, as where short bedding is used a good deal of it sticks to the cows after they rise, and is then liable to fall into the milking pail. Only in a very few cases was cotton waste or shoddy being used, and horse manure not at all.

Manchester Milk Clauses.

The Manchester Milk Clauses are embodied in the Manchester General Powers Act, 1899, and were given in the Annual Report for 1898.

The clauses came into operation on January 11th last, but previous to that they had been advertised in five newspapers circulating in the districts from which milk is supplied to Manchester, and, in addition, a copy of the clauses was sent by post to the address of every farmer supplying milk to Manchester whose name could be ascertained.

The method according to which the clauses are worked is as follows :—

Sterilised bottles are first obtained from Professor Delépine, of Owens College. Each bottle is provided with a rubber cork, a ladle, and a metal case, each of which is sterilised. Provided with a number of these, one of the Food and Drugs Inspectors goes to one or other of the Manchester railway stations and takes samples of milk from the farmers' cans as they arrive at the station. Each sample of milk, after being duly labelled and numbered (a copy of label and number is kept at the Public Health Office), is submitted to Professor Delépine for bacteriological examination.

At the commencement, samples were taken at the rate of 20 a week, but latterly only 10 a week have been taken. Again, owing to holidays, examinations, &c., the stoppage of samples is occasionally necessary, but any shortage on that account is probably made up by special samples which have been taken from individual cows having suspicious or diseased udders.

Professor Delépine's examinations usually take about four weeks before the result of such examination is received at the Public Health Office.

In regard to the samples which Professor Delépine certifies as being incapable of causing tuberculosis, the only thing remaining to be done is to ascertain from the farmer the number of cows from which the sample of milk was taken, and which were milking on the farm at that time. This information is required for statistical purposes.

When a sample is certified as being capable of causing tuberculosis, an order is then obtained from a justice of the peace having jurisdiction in the district in which the farm is situate from which the sample of milk certified infective has been sent. This order empowers the Medical Officer of Health or any person provided with, and if required exhibiting, the authority in writing of the Medical Officer of Health, if accompanied by a properly qualified Veterinary Surgeon, to at all reasonable hours enter the dairy and inspect the cows kept therein, and to take samples of the milk from any cow which may be suspected of suffering from tuberculosis of the udder. Armed with this authority, the Medical Officer of Health or his deputy visits the farm accompanied by the Veterinary Surgeon, who proceeds to examine the cows on the farm, taking samples from all cows whose udders may be affected with, or suspected of, or exhibiting signs of, tuberculosis. These special samples, which are milked directly into sterilized bottles by the Veterinary Surgeon, are also submitted to Professor Delépine for bacteriological examination, and he reports thereon.

The examination of these special samples necessarily causes some unavoidable delay, but it is a great aid to the diagnosis of the Veterinary Surgeon in doubtful cases, and further ensures the impossibility of error.

Tuberculous Milks.

As a result of inspecting the 603 cows in the Manchester cowsheds, only 12 were found to have some affection of the udder, and in only one instance was that affection of a tuberculous nature. In three other cases the udders were indurated, but in each instance the sample of milk taken from them was. after examination by Professor Delépine, certified as being incapable of causing tuberculosis. The remaining number of affected udders, viz., eight, were cases of atrophy.

The result of inspecting the 555 cows in the cowsheds just outside Manchester, the milk from which is brought into Manchester direct by cart, was to discover 39 cows having some affection of the udder. Two cows had tuberculous udders, and eight had indurated udders. Samples of milk were taken from these ten cows and submitted to Professor Delépine for bacteriological examination, with the result that he certified the samples from the first two to be capable of producing tuberculosis, and the last eight to be incapable of doing so. The remaining twenty-nine cows had only minor affections of the udder.

Seven hundred and twenty-nine cows at twenty-nine farms have been inspected without previous samples being taken at the railway stations. Thirty-three cows were discovered as having some affection of the udder. Three of these had tuberculous udders, twelve were indurated (non tuberculous), and one had mastitis. Sixteen samples were taken from these, and submitted to Professor Delépine for examination. Three were certified as capable of causing tuberculosis, and thirteen were certified as being incapable of doing so. The remaining seventeen cows had only minor affections, chiefly atrophy.

Up to April 30th, 135 samples had been taken at the Manchester stations, and these represented the milk from 108 farms, at which there were 2060 milking cows. Twelve of these samples were certified by Professor Delépine as being capable of producing tuberculosis. The 12 farms from which this infective milk was sent to Manchester were visited, but at only five of these could cows with tuberculous udders be found, although at one of them two cows had tuberculous udders, thus making a total of six cows giving infective milk. At four out of the remaining seven farms the occupiers admitted having recently disposed of diseased cows. Further station samples taken from the milk supplied from these seven farms were taken and submitted to Professor Delépine, who certified six of them as being incapable of producing tuberculosis. This seems to indicate that the source of infection had in those six cases been removed. In regard to the seventh case a positive result was reported by Professor Delépine, and a cow with a diseased udder has since been discovered at the farm implicated.

The following is a detailed account in each instance when a sample of milk has proved tuberculous, or when clinical examination has seemed to show tuberculosis of the udder:—

I.—On January 25th I visited the farm of

at Higher Blackley, and examined the udders of 24 milking cows. I found one cow affected with tuberculosis of the left hind quarter of the udder. A sample of milk was taken from the affected quarter and submitted for bacteriological examination to Professor Delépine, who reported that the milk was found to produce tuberculosis. The cow was isolated, and her milk, which was only a small quantity, was disused for human consumption. After a correspondence with the Medical Officer of Health, and two interviews with myself, the owner determined to have the cow slaughtered. This was done in my presence at the Water Street Abattoirs on the 7th of March. A post-mortem examination was made by myself and Mr. A. Holborn, M.R.C.V.S., the Chief Veterinary Inspector at the Abattoirs. The carcase of this cow was found not to be badly affected, and was well nourished. There were several caseous centres in the lungs and a few recent tuberculous growths on the peritoneum. The affected quarter of the udder was found to be only superficially diseased, the centre being apparently healthy to the naked eye. The mammary lymphatic gland was affected, but not extensively. The diseased parts were removed and destroyed, the remainder of the carcase being passed.

II.—I visited the farm of

at Withington on January 31st, and examined the udders of 32 cows in milk. I found one cow having a tuberculous udder. A sample of milk was taken from the affected quarter of the udder and submitted to Professor Delépine, who reported that tubercle bacilli had been found in the sample by microscopical examination. The cow was at once isolated, and the owners stopped selling her milk for human consumption. After considerable correspondence between the Medical Officer of Health and the owners, the cow was taken to Salford Cattle Market, and sold to a butcher and cattle dealer from Liverpool.

III.—I visited the cowshed of , of Gorton, on February 6th, and after an examination of 14 milking cows discovered one which was affected with tuberculosis of the udder. A sample of milk taken from the affected quarter of the udder was submitted to Professor Delépine, who reported that tubercle bacilli had been found in the milk by microscopical examination. The cow was isolated, and the sale of her milk stopped. After a short correspondence between the Medical Officer of Health and the owner, and one interview which I had with the owner, the latter sent the cow to a knacker's yard at Stockport, where the cow was slaughtered in my presence on February 20th. A post-mortem examination of this carcase was made by me, and I found the carcase to be emaciated and generally diseased. The mesenteric lymphatic glands were quadrupled in size and caseous. The pleura, peritoneum, and lungs were only slightly affected. The mammary lymphatic gland was not extensively diseased, although the disease in the udder was pretty general throughout the affected quarter.

IV.—A sample of milk was taken on January 18th at London Road Station from a churn belonging to , of Willaston, Cheshire, by one of the Food and Drugs Inspectors. This was submitted to Professor Delépine, who reported it to be capable of producing tuberculosis. I visited the farm on February 27th, and examined the udders of 22 cows. One cow was found to have a diseased udder. A sample of milk from the affected quarter of the udder was submitted to Professor Delépine, who reported that tubercle bacilli had been found in the milk by microscopical examination. The owner was then written to by the Medical Officer of Health, informing him of his liability under the Manchester General Powers Act, and asking that the cow should be isolated and the sale of her milk stopped. The owner informed me at the time of my visit that he intended selling the cow for slaughtering purposes at Crewe Auction Mart.

V.—On January 29th one of the Food and Drug Inspectors took a sample of milk at London Road Station from a milk can belonging to , of Gawsworth, Cheshire. This was submitted to Professor Delépine, who certified it as being capable of producing tuberculosis. I visited the farm on March 5th, and examined the udders of 35 milking cows. Four cows were found showing signs suspicious of tuberculosis of the udder. A sample of milk was taken from each and submitted to Professor Delépine, who reported that tubercle bacilli had been found in one of the samples by microscopical examination, and later reported that a second sample was capable of producing tuberculosis. The owner was then written by the Medical Officer of Health, informing him of the identification of the two cows from which the infective samples had been taken, and requesting him to have such isolated and dried off—not to sell the milk for human consumption. The owner wrote agreeing to this, and promising to sell the cows only for slaughter, and to advise the Medical Officer of Health when they were sold, and to whom. On June 5th, however, theowner wrote to say the cows had been sold on May 17th, but did not state the name of the buyer, which it was found impossible to ascertain.

VI.—A sample of milk was taken at Longsight Station on January 22nd from a tankard the property of , of Gawsworth, Cheshire. This was submitted to Professor Delépine, who reported it as being capable of producing tuberculosis. I visited the farm on the 5th of March, and examined the udders of 20 cows. Three cows had udders more or less indurated, and a sample of milk was taken from each. These samples were submitted to Professor Delépine, who reported each as being incapable of producing tuberculosis. At a subsequent visit the owner informed me that he had sold one of these three cows at Macclesfield Auction on March 19th, that he had ceased to send milk for sale in Manchester, but that previous to the first sample being taken he had sometimes been in the habit of buying milk from a neighbour when he was short in his own supply. This bought milk may have been the source of the infection of his station sample.

VII.—A sample of milk which was taken at London Road Station on February 1st from a tankard the property of , Poynton, Cheshire, was, on examination by Professor Delépine, reported as being capable of producing tuberculosis. I visited the farm on March 9th and examined the udders of 16 milking cows, but was unable definitely to specify any particular cow as having a tuberculous udder. The owner stated that he had recently sold three cows, his reason for doing so being stated to be recent abortion. He would not admit that any of them had a diseased udder. A control sample of the milk from this farm was taken at the time of my visit and submitted to Professor Delépine, who reported it as being incapable of producing tuberculosis. This seems to point to the removal of the cow giving infective milk previous to my visit.

VIII.—A sample of milk was taken by one of the Food and Drugs Inspectors on February 8th at the Central Station from a milk can belonging to , Ollerton, Knutsford. This was submitted to Professor Delépine, who reported it capable of producing tuberculosis. I visited the farm on March 20th and examined the udders of 25 milking cows, but was unable to find a cow with a tuberculous udder. One cow had slight induration of the udder, and a sample of her milk was taken and submitted to Professor Delépine, who certified it as being incapable of producing tuberculosis. A second station sample of the milk from this farm was then submitted to Professor Delépine, and this was reported by him as being capable of producing tuberculosis. I visited the farm again on May 31st, and examined the udders of 26 milch cows, when I found two cows with suspicious udders. A sample of the milk from each of these two cows was taken and submitted to Professor Delépine, who reported one of them as being capable of producing tuberculosis. The owner was written by the Medical Officer of Health, informing him of the identity of the cow with the tuberculous udder, and, after some further correspondence, the owner arranged to have the cow slaughtered at Knutsford on July 16th. I visited Knutsford on that date and made a post-mortem examination of the carcase. The carcase was in very fair condition, and killed a good colour. There was slight caseation in the lungs, one caseous nodule in the liver, extensive recent disease of the pleura and peritoneum, well-developed disease of the udder and right mammary lymphatic gland. No disease could be detected in any of the other lymphatic glands by the naked eye. The carcase was condemned by the Medical Officer of Health for the District in accordance with the directions of the Local Government Board.

IX.—A sample of milk was taken on February 8th at the Central Station from a tankard the property of , of Mouldsworth, Cheshire. This was submitted to Professor Delépine, who reported it capable of producing tuberculosis. I visited the farm on March 21st, and examined the udders of 27 milking cows, but was unable to find any cow with a tuberculous udder. The owner's son stated that he had sold a cow at Chester Auction Mart on March 13th, which cow he knew to have a diseased udder, which was gradually getting harder and larger. Further station samples were then taken of the milk supplied from this farm and submitted to Professor Delépine, who reported them as being incapable of producing tuberculosis.

X.—A sample of milk which was taken on January 25th at Longsight Station from a tankard belong to , of Rushton, Cheshire, was, on examination by Professor Delépine, certified as being capable of producing tuberculosis. I visited the farm on March 5th, and examined the udders of 26 cows. Two cows showed signs suspicious of tuberculosis of the udder, and a sample of milk from each of these two cows was taken and submitted to Professor Delépine, who reported them to be incapable of producing tuberculosis. A second station sample of the milk supplied from this farm was then taken and sent to Professor Delépine, who reported it as being incapable of producing tuberculosis. Previous to the taking of the second station sample, however, the owner called to see the Medical Officer of Health, and at the same time informed me that he had sold one of the suspicious cows at Leek Auction on March 8th.

XI. A sample of milk was taken on February 1st at London Road Station from a tankard belonging to , of Doveholes, Derbyshire. This was submitted to Professor Delépine, who reported it as being capable of producing tuberculosis. I visited the farm on March 16th and examined the udders of 14 milking cows. I could only discover one cow having a slight induration of the udder, and she was a cow in good condition. A sample of her milk was submitted to Professor Delépine, who reported it as being incapable of producing tuberculosis. A second station sample of the milk supplied from this farm was then sent for examination to Professor Delépine, who reported it as being incapable of producing tuberculosis. I could not ascertain that any diseased cows had been sold from this farm, or that there was any other source of milk supply.

XII. I visited the farm of , of Capesthorne, Cheshire, on March 30th, and examined the udders of 42 cows in milk. I found four cows showing signs suspicious of tuberculosis of the udder. Samples of the milk from each of these cows were taken and submitted to Professor Delépine, who reported that in one of the samples tubercle bacilli had been found by microscopical examination, and later reported that a second sample was capable of producing tuberculosis. I again visited this farm on May 4th, and gave the owner the result of the examination and the identity of the cows having tuberculous udders. He then informed me that he had sold one of the cows on April 2nd to a butcher at Knutsford for slaughter, and he promised to isolate the other cow at once and stop sending her milk for sale for human consumption, and not to sell her except for slaughter.

XIII.—On April 2nd I visited the farm of , of Mobberley, and examined the udders of 20 milch cows. I found one having a badly diseased udder, the cow was very thin, and showed clinical evidence of being in an advanced stage of tuberculosis. A sample of the milk from this cow was submitted to Professor Delépine, who reported it capable of producing tuberculosis. I again visited the farm on May 3rd and acquainted the owner with the result of the examination, and he then informed me that he had sold the cow to a pig dealer at Knutsford for knacker purposes.

XIV.—A sample of milk was taken on March 5th at London Road Station from a can the property of , Goostrey, Cheshire. This was submitted to Professor Delépine, who reported it capable of producing tuberculosis. I visited the farm on April 11th and examined the udders of 20 milking cows, but could find no cow with a tuberculosis udder. The owner informed me that he had sold a diseased cow a few weeks before to a stranger. Further control samples were then taken at the station from two cans belonging to this farmer, and these were submitted to Professor Delépine, who reported them incapable of producing tuberculosis.

XV.—A sample of milk which was taken on March 5th at London Road Station from a can belonging to , of Disley, Cheshire, was submitted to Professor Delépine, who reported it as capable of producing tuberculosis. I visited the farm on April 10th and examined the udders of 16 cows in milk. One cow had a slightly indurated udder, and a sample of her milk was taken and submitted to Professor Delépine, who reported it as being incapable of producing tuberculosis. I again visited this farm and examined the cows, but could find no cow with a diseased udder, and consequently took a control sample of the milk supplied from the farm. This was submitted to Professor Delépine, who reported it incapable of producing tuberculosis. I could get no history of any diseased cow being sold from this farm or of any other source of milk supply.

XVI.—A sample of milk was taken on April 9th at Longsight Station from a can the property of , of Mottram St. Andrew's, Cheshire. This was submitted to Professor Delépine, who reported it capable of producing tuberculosis. I visited the farm on May 9th and examined the udders of 31 cows in milk. I found three cows showing signs more or less suspicious of tuberculosis of the udder. Samples of milk were taken from these three cows and submitted to Professor Delépine, who reported one of them as being capable of producing tuberculosis. The Medical Officer of Health then wrote the owner, pointing out the identity of the cow with the diseased udder, and asking him to isolate her and stop sending her milk to Manchester or using it for human consumption; also not to sell her as a milk-producing animal, or except for immediate slaughter. The farmer replied, agreeing to do so.

J. S. Lloyd, M.R.C.V.S.

COMMON LODGING-HOUSES.

The following report was written as the outcome of an elaborate inspection of common lodging-houses made in 1899. It was first sent to the members of the Unhealthy Dwellings Sub-Committee, and then, by the instruction of the Chairman of that Committee, it was sent to the members of the Watch Committee, by whom it was considered, approved, and returned to the Unhealthy Dwellings Sub-Committee. It will be seen that it contemplates piecemeal alterations in the arrangements of common lodging-houses.

REPORT ON COMMON LODGING-HOUSES.

What is a Common Lodging-house?

Common lodging-houses in Manchester are registered under the police, and are liable to certain specific regulations. It might be supposed, therefore, that the definition was a matter of no great moment, since the fact of such registration is sufficient to define this class of dwelling. This, however, is not the case, since it not rarely becomes a matter for consideration whether a certain house should be transferred from the register of houses let in lodgings to the register of common lodging-houses, and *vice versa*, and so intimate is the connection between these two classes of dwellings that no step can be taken affecting the one which does not immediately concern the other.

It is no doubt true that of the two classes, taking them in the aggregate, the inhabitants of houses let in lodgings are cleaner, more temperate, live under better sanitary conditions, require less to be under the supervision of the police, and generally occupy a somewhat higher position in the social scale. But to this rule there are many exceptions, and the one class dovetails into the other.

Hence in any administrative action which may be taken with regard to common lodging-houses it is necessary to keep a backward eye on houses let in lodgings, so as to make sure that in improving the status of the former we do not deteriorate the condition of the latter.

The term "common lodging-house" has been variously defined to connote a house in which persons lodge for a brief period, in which the sleeping rooms are occupied by persons who are strangers to each other, that is to say, who do not belong to one family, and who require supervision. The law officers of the Crown have declared that the duration of stay in a common lodging-house has nothing to do with the definition, and, indeed, many inhabitants of common lodging-houses remain in the same house from one year's end to another. Nor, indeed, can any one of the other characters enumerated be said to be distinctive, as one can satisfy oneself at a glance by comparing a set of regulations affecting houses let in lodgings with the bye-laws relating to common lodging-houses. There is no absolute line of demarcation between the two classes of dwelling, and something more must usually be supposed to be implied.

Mr. Hudson has kindly affixed the following rider to the above remarks :—

"In 'Langdon *v.* Broadbent,' 37 L.T. (N.S.), 434; 42 J.P., 56, it was held "that a lodging-house where hawkers and persons of a similar class were "received, staying for various periods, having their meals in one room, and "paying sixpence a night was a common lodging-house within the above "section." Grove, J., said: "Each case must be decided on its own facts. "There may be lodging-houses resorted to by a higher class of persons to "which the term 'common lodging-house' would not be applicable. The "case does not find whether the lodgers occupied separate sleeping "apartments. But I do not think it is necessary to show that the lodgers "are all herded together in order to bring the case within the statute. Even "if a common room is necessary to constitute a common lodging-house, "the evidence here shows that they all took their meals together."

An artificial line of demarcation is set up by the Manchester regulations respecting houses let in lodgings in the requirement that 500 cubic feet of sleeping room must be provided for each adult inmate, a regulation which does unquestionably make a difference in fact, and makes it a matter of no little importance to the keeper whether his house is registered under the police as a common lodging-house or under the Sanitary Authority as a house let in lodgings. In differentiating, regard must be had to two considerations, viz.: (1) What is the class of people who might be expected to resort to the house? (2) What is their number? Assuming that there was some difficulty in settling the proper class of a house, if the total number of people (being strangers to each other) resorting to a house as lodgers exceeded six, or if the number inhabiting any one room exceeded three, the house should be registered as a common lodging-house, nor should the lodging in one room of a smaller number exceeding one exempt the house if circumstances arose which seemed to require police supervision.

The Class of Persons Inhabiting Common Lodging-houses.

In the Annual Report on the Health of Manchester for the year 1898 is given an analysis of the inhabitants of the 206 common lodging-houses on the register obtained in the early part of 1899 by the Chief Constable (Mr. Robert Peacock). This valuable return is here reproduced. As regards the females, a large proportion of them are, apparently, prostitutes. With respect to the men, the conditions of life are not so attractive in any of the houses that one need hesitate to say that they are mostly brought to inhabit them by stress of circumstances. In not a few instances the smallness of the wages which they earn is the reason why they live in these houses. But these are the minority. It will be seen that those described as tramps number 441 out of a total of 5,831, or 1 out of every 13. But, as Mr. Phillips has pointed out, in the cold weather many of these enter the Workhouse, and the proportion in summer would no doubt be much higher. It is to this class that we must look for the transference of smallpox, and other dangerous forms of infectious diseases, from one district to another.

The persons of no occupation number 604, or over a tenth of the total. These comprise criminals and prostitutes, and it is their occupation of these houses which renders supervision by the police a necessity.

Of the large class described as labourers, it need only be said that many of them follow grimy and dirty occupations, and that they contribute largely to render the cleansing of the houses difficult both on this account and from the frequent absence of personal cleanliness, which in turn may, in part, be reasonably ascribed to the utter inadequacy of the appliances for cleaning the person which is often found in these houses.

Occupations of Persons Living in Common Lodging-houses.

The occupations of persons inhabiting them is shown in the following return, which the Chief Constable was good enough to arrange and obtain for me :—

	DIVISIONS				
	A.	B.	C.	D.	Total
Hawkers	499	19	74	44	636
Tramps	417	7	7	10	441
Organ Grinders	23	0	0	1	24
Bill Posters	16	0	2	12	30
Flower Sellers	104	1	16	1	122
Toy Sellers	62	0	1	4	67
News Vendors	108	3	5	32	148
Railway Porters	73	6	29	47	155
Hotel Porters	73	9	14	25	121
Labourers	1261	155	242	261	1919
Blacksmiths	27	2	19	11	59
Gas Stokers	49	1	17	3	70
Carters	110	14	27	27	178
Joiners	71	8	12	9	100
Bakers	36	3	5	8	52
Butchers	61	3	9	14	87
Tailors	77	5	13	22	117

Occupations of Persons Living in Common Lodging-houses—continued.

	DIVISIONS				
	A.	B.	C.	D.	Total
Shoemakers	151	6	15	24	196
Stablemen	92	10	14	35	151
Cabmen	19	0	3	17	39
Tram Drivers	2	0	0	0	2
Mechanics	103	5	24	30	162
Clerks	41	3	6	40	90
Millhands	52	0	12	4	68
Market Porters	25	0	0	0	25
Washerwomen	53	0	4	0	57
Machinists	4	0	3	0	7
Mason	0	0	1	0	1
Cooper	0	0	1	0	1
Polishers	2	0	1	0	3
Upholsterers	1	0	1	0	2
Saddlers	0	0	2	0	2
Painters	6	4	1	6	17
Bricklayers	1	6	2	0	9
Plumbers	1	0	0	2	3
Cloth Carriers	0	0	0	5	5
Time Keeper	0	0	0	1	1
Window Cleaners	1	0	0	1	2
Travellers	0	0	0	3	3
Seaman	0	0	0	1	1
Warehousemen	12	0	0	13	25
Hairdressers	3	1	0	1	5
Grocers' Assistants	0	2	0	4	6
Slaters	0	1	0	1	2
Drapers	0	3	0	1	4
Wood Carver	0	1	0	0	1
Racing Touts	0	2	0	0	2
Compositor and Printers	2	1	0	0	3
Sugar Boiler	0	1	0	0	1
Brush Makers	0	2	0	0	2
Bookbinder	0	1	0	0	1
Dyer	0	1	0	0	1
Drover	0	1	0	0	1
No occupation Males	185	3	2	43	233
No occupation Females	326	0	44	1	371
All Trades	4149	290	628	764	5331

How far do these Figures enable us to judge of the provision of Model Lodging-houses required?

In order to answer this question, we must suppose the tramps and unemployed subtracted from the total of 5,831, which leaves 4,786 persons. Of these we may assume that half, or 2,393, are able to pay 6d. for their night's lodging, and it would probably be fair to suppose that fully one-half of these would be induced to have recourse to a better class of house, and to conform to new conditions. But it must not be supposed that dwellings like the Rowton Houses attract only those who would go to an inferior class of common lodging-house. It is probable that, besides the best class of men resorting to common lodging-houses, they receive many who would with inferior accommodation live in houses let in lodgings.

If we suppose that there are at least 2,000 men in Manchester who would avail themselves of such houses, we should probably be under the mark.

Common Lodging-houses as Centres of Infection.

It has already been mentioned that the inhabitants of common lodging-houses in epidemic periods convey diseases such as smallpox and typhus fever from one district to another.

Introduced into a common lodging-house in such a district as Manchester, an infectious disease spreads in the house into which it has been introduced, and that more readily and extensively where there is a deficiency of day-room or crowding of beds on area. From thence it radiates forth into the community.

There is one disease—viz., consumption—which does not need to be introduced, being already in possession, and which plays great havoc amongst the inhabitants of common lodging-houses. It may be recalled that from 77 common lodging-houses in the Angel Meadow district, containing an average population of 1,825 persons, the death registers furnished in the years 1893-95 110 deaths from phthisis, giving an annual death-rate of over 20 per thousand during that period.

One must not suppose that the mischief is confined to the inhabitants of these houses. The consumptive labourers, hawkers, joiners, bakers, butchers, tailors, mechanics, clerks, washerwomen, will not only give the disease to their workmates who do not live in a common lodging-house, but may, in some employments, convey it to those who purchase the goods which they are engaged in producing or vending. Moreover, they will certainly disseminate it in the district in which they live.

We do not need, however, to restrict ourselves to phthisis in estimating the mortality amongst the inhabitants of common lodging-houses. I have had the total deaths from the 77 lodging-houses above mentioned occurring in the workhouses and other institutions in the City, as well as in the houses themselves, excerpted for the same period. They numbered 424, which gives the enormous annual death-rate of 77·44 per thousand inmates.

From these considerations, it is plain that the most strenuous efforts should be made to prevent the disease and mortality which are liable to be produced by any neglect of the sanitary conditions of these houses.

The Sanitary Requirements of Common Lodging-houses.

These are laid down in the following general terms by the Local Government Board in their Memorandum on Common Lodging-houses:—

> "The rules which should guide the inspecting officer in his examination of the premises may be thus briefly indicated:—
>
> "The house should (1) possess the conditions of wholesomeness needed for dwelling-houses in general; and (2) it should further have arrangements fitting it for its special purpose of receiving a given number of lodgers.
>
> "(1.) The house should be dry in its foundations and have proper drainage, guttering, and spouting, with properly laid and substantial paving to any area or yard abutting on it. Its drains should have their connections properly made, and they should be trapped, where necessary, and adequately ventilated. Except the soil pipe from a properly trapped water-closet, there should be no direct communication of the drains with the interior of the house. All waste pipes from sinks, basins, and cisterns should discharge in the open air over gullies outside the house. The soil pipe should always be efficiently ventilated. The closets or privies and the refuse receptacles of the house should be in proper situations, of proper construction, and adapted to any scavenging arrangements that may be in force in the district. The house should have a water supply of good quality, and if the water be stored in cisterns they should be conveniently placed, and of proper construction to prevent any fouling of water. The walls, roof, and floors of the house should be in good repair. Inside walls should not be papered. The rooms and staircases should possess the means of complete ventilation; windows being of adequate size, able to be opened to their full extent, or, if sash windows, both at top and bottom. Any room proposed for registration that has not a chimney should be furnished with a special ventilating opening or shaft; but a room not having a window to the outer air, even if it have special means of ventilation, can seldom be proper for registration.

"(2.) The numbers for which the house and each sleeping room may be registered will depend, partly upon the dimensions of the rooms and their facilities for ventilation and partly upon the amount of accommodation of other kinds. In rooms of ordinary construction to be used for sleeping, where there are the usual means of ventilation by windows and chimneys, about 300 cubic feet will be a proper standard of space to secure to each person; but in many rooms it will be right to appoint a larger space, and this can only be determined on inspection of the particular room. The house should possess kitchen and day-room accommodation apart from its bedrooms, and the sufficiency of this will have to be attended to. Rooms that are partially underground may not be improper for day-rooms, but should not be registered for use as bedrooms. The amount of water supply, closet or privy accommodation, and the provision of refuse receptacles should be proportionate to the numbers for which the house is to be registered. If the water is not supplied from works with constant service, a quantity should be secured for daily use on a scale per registered inmate of not less than ten gallons a day where there are water-closets, or five gallons a day where there are dry-closets. For every twenty registered lodgers a separate closet or privy should be required. The washing accommodation should, wherever practicable, be in a special place, and not be in the bedrooms; and the basins for personal washing should be fixed, and have water-taps and discharge-pipes connected with them.

"Arrangements for the supply by the Sanitary Authority of placards such as are mentioned in the bye-laws numbered 23 and 24 in the model series may be suggested as conducive to the well-ordering of common lodging-houses.

"John Lambert,
"Secretary.

"Local Government Board,
"25th July, 1877."

These, it must be observed, are minimum requirements, and need some annotating from the results of experience. First with regard to the yard, it is a matter of very great moment that some yard provision should be made in the great majority of cases, and that the Manchester bye-law requiring the surface of the yard to be impervious be strictly enforced. As regards the construction of the closets, as Mr. Phillips has pointed out, the opening of the seat should be made of a convenient shape, and a pail-closet is, generally speaking, unsuitable for this class of house.

In every yard a urinal should be provided, unless some better arrangement can be made.

The necessity of good internal repair is not always fully understood. But, on reflection, it will be seen to be impossible to adequately cleanse and disinfect any house with broken walls or openings into the floors.

Emphasis should be laid on the need for ventilation of staircases.

With regard to the 300 cubic feet of sleeping-room space recommended as a proper provision, it is pointed out in the memorandum that in many rooms it will be right to appoint a larger space. In his paper before the International Congress of Demography, 1891, Mr. Gordon Smith stated that 300 cubic feet could not be regarded as adequate, but that the amount was fixed with reference to the provision possible to be attained in London. Where, however, the result is that beds are placed against each other, or are so arranged as to obstruct ventilation by the chimney, there the provision is inadequate.

Then, again, if a considerable portion of a sleeping-room is so situated or so used that it can only be partially reached by the circulating currents of air, there also the provision of 300 cubic feet is inadequate.

As has often been pointed out, it is impossible on this standard to provide the amount of air necessary for a reasonable degree of purity without draughts. There is but one way without artificial means of warming by which this may be effected, viz., by providing a large surface of grated openings abutting on an outer wall. Such provision will certainly make the air of the room cold, and a plentiful supply of good clean bedclothes is thus required.

There is, thus, no way in which ventilation can be made reasonably efficient without entailing additional expense on the lodging-house keeper and also on the owner of the house.

It is, nevertheless, an aim to be kept constantly in view, since the fœtid atmosphere of the sleeping-rooms must be most destructive to health.

Again, as regards the amount of day-room provided, your Medical Officer of Health is of opinion that in no case should it fall below 120 cubic feet per registered bed. It is true that the whole of the day-room is not taken up in most of the common lodging-houses, except, perhaps, at the week-end; but so great is the movement in these rooms, one of which is often the kitchen, and so horribly close do they become, that an ampler provision than is now accorded must be regarded as a necessity. It is in the day-rooms that phthisis and other infectious diseases are most easily communicated. For this reason the room should be well lighted, well ventilated, and kept thoroughly clean. Spitting on the floor should be prohibited. The walls should be dry.

As regards provision for personal cleanliness, there should be a fixed wash-basin with approved fittings for every 20 men. These basins should be so situated as to be reasonably accessible and reasonably comfortable to the inmates. A hot bath should be procurable at a small charge.

In many houses it can be seen that urine has been spilled on the floor, and has made its way through it. Floors should be impermeable to liquid, and should, therefore, be constructed of tongued and grooved boards. A common zinc vessel for the use of the inmates of a sleeping room has, it is said, this advantage over separate chamber-pots, that it is not so easily upset by men in liquor. Whether, however, one or the other is used, means should be provided for preventing urine from getting through the floor.

These are merely expansions of the Local Government Board requirements. But the model lodging-houses erected in London by Lord Rowton show that, for all but the very poorest class, a common lodging-house may be equipped with almost every possible convenience at 6d. a night per inmate, and pay its way.

The Rowton houses are well constructed and beautifully finished internally with glazed bricks. They contain everything necessary for the comfort of the inmates, including a magnificent dining-room, smoke-room and reading-room. well-equipped laundries, bathroom, lavatories, closets, urinals, locker-rooms, kitchens, and shops. The dormitories are constructed like the wards of a hospital, and the air is renewed by cross-ventilation. These dormitories are subdivided into cubicles, and amply provided with closets and fire-escapes. In fact nothing is left unconsidered which may secure the health, comfort, and safety of the inmates. Nor is it now necessary to go to London to see how excellent is the provision made for this class of people, since the Harrison Street Lodging-house recently erected in this City, which is modelled on the Rowton houses, exhibits all the excellencies of the London houses, though on a smaller scale.

We have a right to infer that a higher standard may reasonably be required of all newly registered houses, and that houses already on the register should be required to fulfil the conditions which have been mentioned in this section.

On the Present Condition of Common Lodging-houses in Manchester.

The common lodging-houses of this City have been subjected to a most careful and exhaustive examination. Towards the end of 1898 I applied to Mr. Rook for an Inspector who should make such an examination as might give a full idea of their fitness, and serve as material on which an endeavour to ameliorate their condition might be based. We arranged that Inspector Bruford should be appointed for this duty. His examination and reports took over six months to complete. But, in the result, a most ample and detailed account was obtained for each lodging-house as it was at the time of the Inspector's visit. This was accompanied by a sketch of the rooms on each floor, so that the series is most valuable both in the formation of opinion and for administrative purposes. While this work was going on, Mr. Phillips, acting under the instruction of the Chairman of the Sanitary Committee, made a study of the common lodging-houses from another point of view. While endeavouring to ascertain the sanitary conditions of these houses, Mr. Phillips also studied the character and habits of the inmates, so that his observations have a value of their own. Your Medical Officer of Health has also visited a number of the houses, with a view to check the impression produced by Inspector Bruford's record.

The reports prepared by Inspector Bruford have concerned themselves with the size and condition of the yard attached to the houses, the state of structural repair, the state of internal repair (so far as the walls, floors, windows, staircases, &c., are concerned), the dryness or dampness of the interior, the state of the cellars, the drainage, the provision of closets as regards their sanitary fitness and adequacy to the number of beds, the sufficiency of ventilation, the provision of day-rooms, the arrangements for personal cleanliness, the cleanliness of the house, and in certain matters the adequacy of administration.

One example is given to show the nature of the reports made by Inspector Bruford.

Common Lodging-House, No.......................

Address:

EXTERIOR.

Is the house overshadowed by neighbouring buildings?—Front, no; back, no.

Width of street in front?—20 feet.

Dimensions of yard behind, and how is yard formed?—10 feet 6 inches by 10 feet 6 inches.

Is the house cellared?—Yes.

Are the walls damp?—Yes.

What is the condition of structural repair?—Walls badly pointed, and bulge.

Privy accommodation?—Pail closet; privy floor and walls defective; ash-place floor defective, and privy in a dirty condition.

INTERIOR.—(*See Plan.*)

Questions.

llar

Examination of, as regards damp, light, structural conditions, accessibility, cleanliness, drainage, communication with the building above. To what use is the cellar put. Dimensions. Ventilation?

Answers.

Cellars damp, and rather dark; floor, walls, ceiling, and steps very defective; reached by steps inside; fairly clean; drains defective, bad smell of sewer-gas in the cellar; communication by defective ceiling. Used for washing purposes and day-room. Dimensions, 19ft. 6in. by 14ft. by 7ft. Ventilation bad.

Questions.

round Floor

Rooms occupied as day-rooms, and use to which each is put. Rooms to be numbered. Each room to be described according to:—

1. Its use.
2. Light.
3. Ventilation.
4. Dimensions.
5. Structural conditions.
6. Cleanliness. Sensory perceptions.
7. As far as can be ascertained, the number of people who use the rooms.

Answers.

I.—Bedroom

1. Bedroom.
2. Fair.
3. Insufficient; no fireplace.
4. 13ft. 6in. by 10ft. 6in. by 8ft. 6in.
5. Floor, walls, skirtings, and ceiling defective.
6. Fairly clean; stuffy odour.
7. Four beds.

II.—Bedroom.

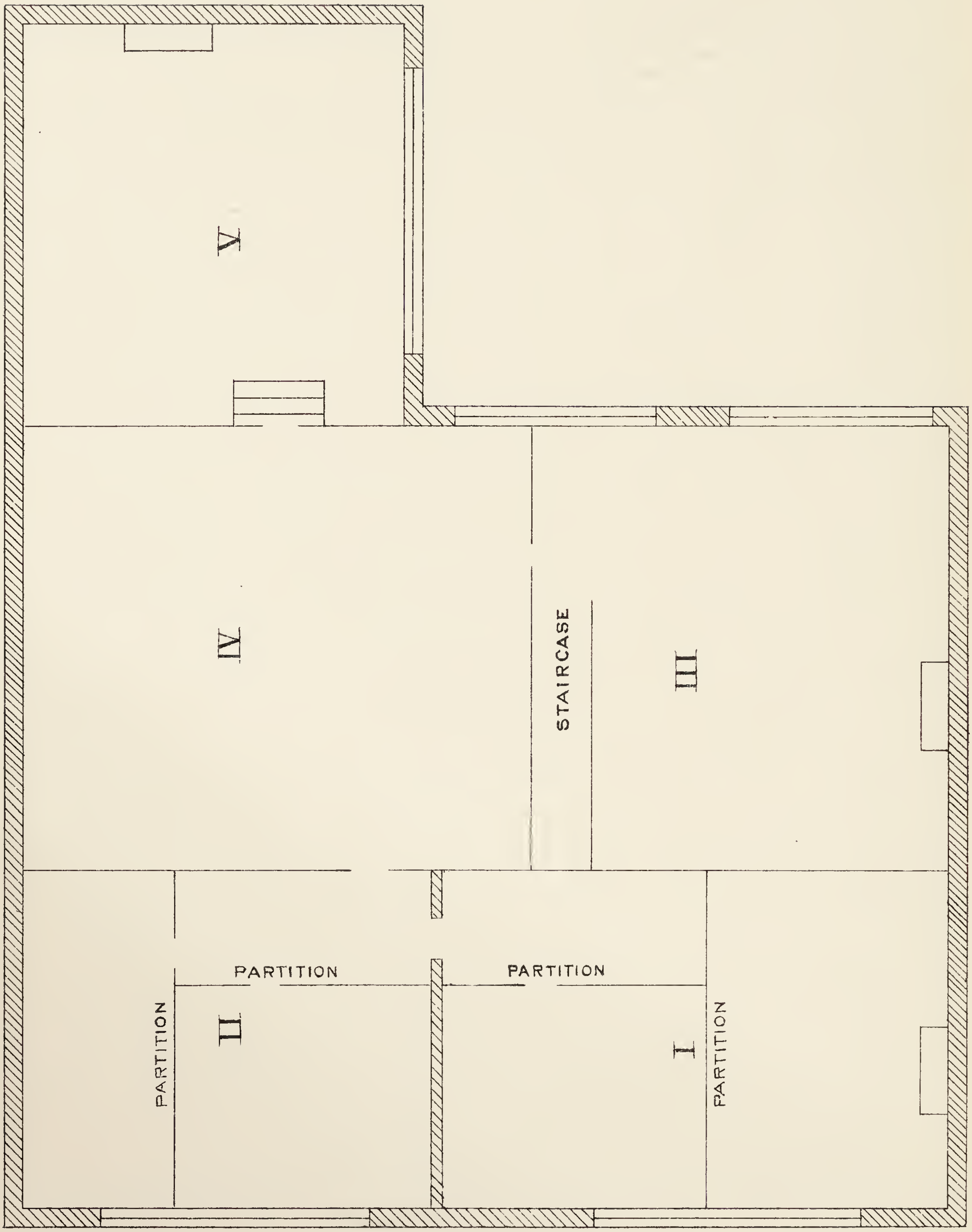
1. Bedroom.
2. Fair.
3. Insufficient; fireplace made up.
4. 11ft. 6in. by 8ft. 6in. by 8ft. 6in.
5. Floor, walls, ceiling, and window defective.
6. Fairly clean; stuffy odour.
7. Two people.

III.—Day Room.

1. Day room.
2. Fair.
3. Insufficient; window does not open.
4. 12ft. by 11ft. by 11ft. 6in.
5. Floor, walls, and ceiling very defective.
6. Fairly clean; stuffy odour.
7. Twelve people.

IV.—Deputy's Bedroom.

1. Bedroom.
2. Rather dark.
3. Insufficient; fireplace made up.
4. 12ft. by 8ft. 6in. by 11ft. 6in.
5. Walls and skirtings very defective
6. Fairly clean; stuffy odour.
7. Two people; registered for three people.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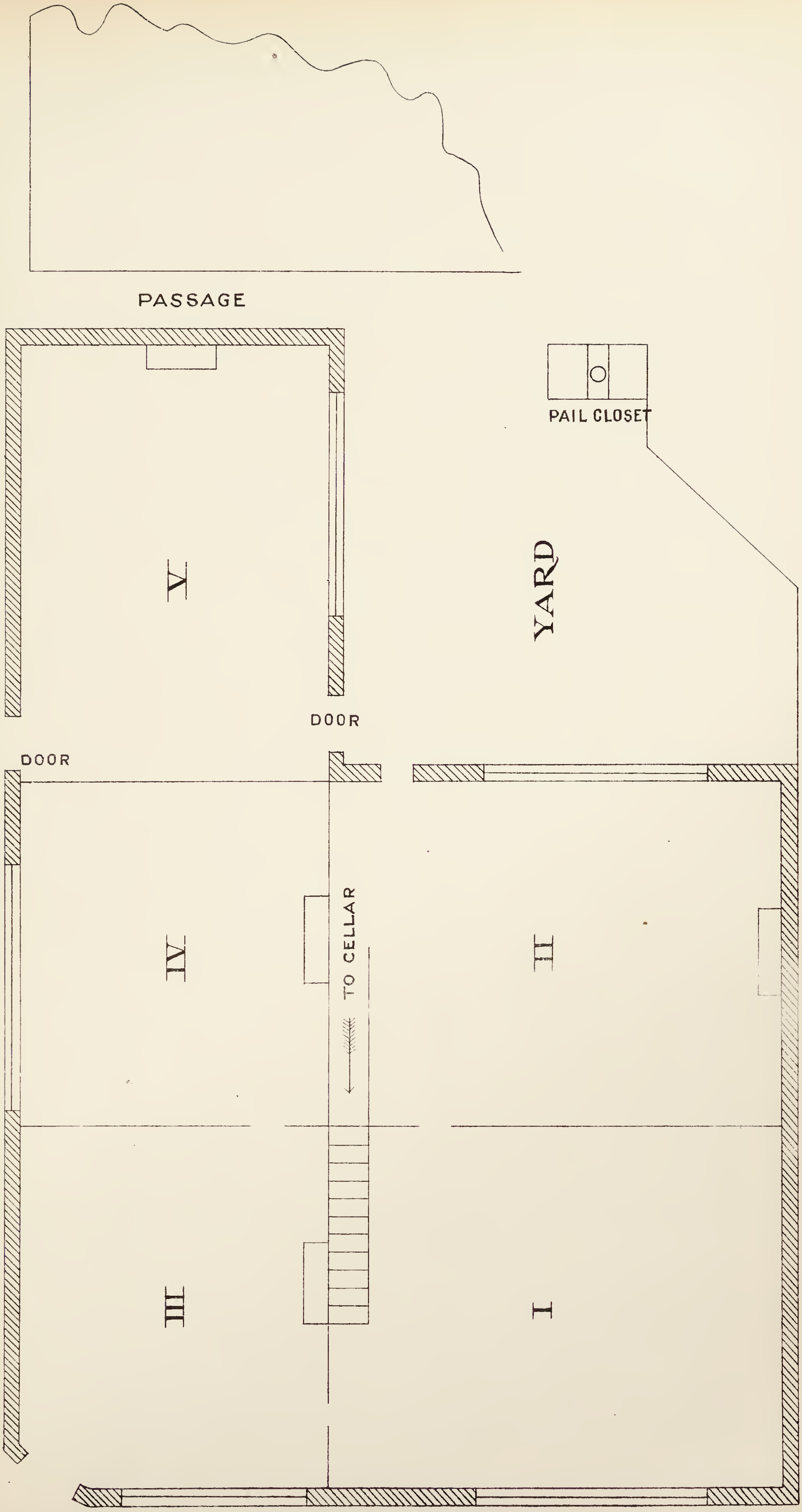
FIRST FLOOR



GROUND FLOOR

V.—Bedroom

1. Bedroom.
2. Rather dark.
3. Insufficient; fireplace made up.
4. 11ft. by 9ft. by 9ft.
5. Floor, walls, and ceiling very defective; walls damp.
6. Fairly clean.
7. Three beds.

First Floor

BEDROOMS (same particulars required as for day-rooms)?

I.—Bedroom, 1st Floor.

1. Bedroom.
2. Rather dark; partitioned.
3. Insufficient.
4. 14ft. by 12ft. by 8ft. 6in.
5. Floor, walls, and ceiling defective.
6. Fairly clean; stuffy odour.
7. Four people.

II.—Bedroom, 1st Floor.

1. Bedroom.
2. Rather dark; partitioned.
3. Insufficient; no fireplace.
4. 14ft. 6in. by 11ft. 6in. by 8ft. 6in.
5. Floor, walls, and ceiling defective.
6. Fairly clean; stuffy odour.
7. Four people.

III.—Bedroom, 1st Floor.

1. Bedroom.
2. Rather dark; window partly boarded up.
3. Insufficient; fireplace made up.
4. 14ft. by 14ft. by 8ft. 6ft.
5. Floor, walls, ceiling, and window defective.
6. Fairly clean.
7. Three people.

IV.—Bedroom, 1st Floor.

1. Bedroom.
2. Rather dark.
3. Insufficient.
4. 12ft. by 8ft. by 8ft. 6in.
5. Floor, walls, and ceiling defective.
6. Fairly clean.
7. Two people.

V.—Bedroom, 1st Floor.

1. Bedroom.
2. Rather dark.
3. Insufficient; fireplace made up.
4. 12 ft. by 6ft. by 6ft.
5. Floor, walls, and ceiling very defective.
6. Fairly clean.
7. One person.

Number of occupants?—20.

For how many registered?—26.

Privy accomodation in the house, if any?—None.

Floor space of day-rooms?—Cellar, 273 square feet; Ground floor, 132 square feet.

Character of occupants?—Hawkers, labourers, plumber, and charwomen (men and women).

Evidences of crowding—

Visible crowding?—Day-room.

Insufficient day-room?—Yes.

Bad ventilation?—Generally bad.

Close, crowded odour?—Yes, day-rooms and bedrooms.

Arrangement of beds?—Arranged in rows, and placed before fireplaces.

General remarks and conclusion.—The walls are badly pointed and bulge; privy floor and walls defective, and ashplace floor defective; the cellar is in a bad state of repair, and drains appear to be very defective; bad smell of sewer-gas in the cellar; there is no slop pipe to the cellar slopstone; the window frames are in a bad state of disrepair; yard surface defective; eaves gutters and downspouts are very defective; the surfaces of the downstair and upstair rooms, and bedroom steps are defective; the skirtings are defective; the plaster of the walls and ceilings of the downstair and upstair rooms is defective, also plaster of staircase walls defective; buckets used in some rooms by lodgers in place of chambers; the day-room washing accommodation and ventilation is insufficient; the house is in a bad state of repair; the cellar drains have been reported to the District Inspector for attention.

Conclusion of Report.

From each of these reports a summary has been put together, which is again summed up at the end, according as the report shows that the house requires immediate attention, or is unfit for its purpose in its present state, or is passed as in a fit and satisfactory condition.

A series of such summaries is here given. (See Table.)

It will be seen that the majority of these houses require immediate attention, and that only a very few can be passed as fit at present for their purpose.

In the great majority of instances the houses are defective structurally. Where these defects concern the roof, eaves gutters, downspouts, and pointing of the walls, they can be rectified; but in a large number the walls bulge, causing the skirtings to separate, and the floors to become dirty.

In most instances also there is internal disrepair, which is not rarely considerable. Defective walls, floors, staircases, &c., render it impossible properly to cleanse and disinfect these houses.

SUMMARY OF CONDITIONS OF COMMON LODGING-HOUSES IN MANCHESTER, 1888-1889.

† Indicates defects under the respective headings. * Very marked defects. – Absence of defects.

No.	Yard		Cellars Defective	Cellar Day-rooms † Yes — No	Structural Defects	Disrepair	Closets Defective	Closets Inadequate	Day-room less than 120ft. per bed †, less than 120ft per inmate*	Damp	Ventilation Defective	Means of Personal Cleanliness	Administration Defective	Drains Defective	Urgently requiring attention * Unfit at present † Passed —	General Remarks
	Defective	Used as Urinal														
1	†	—	? areas dirty	—	†	†	†	*	†	†	†	*	†	...	*	
2	†	—	? do.	—	†	†	†	*	— see paper	†	†	*	†	...	*	
3	† none	—	?	—	†	†	†	*	†	†	†	*	†	...	*	
4	—	—	†	—	†	*	†	* closets of 2	†	†	†	*	†	...	*	
5	† none	—	†	—	†	†	†	* ,,	*	...	†	*	†	...	*	
6	†	...	†	†	†	†	†	†	— bad (see col. 4)	†	†	†	†	†	*	
7	†	...	†	—	†	†	—	†	—	†	†	†	†	—	*	
8	†	...	†	—	†	†	†	—	*	...	†	†	†	†	*	
9	†	...	†	†	†	†	†	†	— bad	*	† ?	†	†	—	*	
10	†	†	†	...	—	† slight	—	†	†	†	†	†	†	†	†	
11	†	...	†	†	† slightly	† slight	†	†	—	†	†	†	—	†	†	
12	† none	—	—	—	—	†	† badly placed	—	—	†	†	†	†	†	†	
13	† none	—	† none	—	†	†	† inside	†	†	†	*	†	†	...	*	
14	† none	...	†	—	*	†	*	*	—	—	†	* none	†	...	*	
15	—	...	†	† bad	†	†	† Pail-closet under bedroom 3 def.	†	†	†	†	†	—	—	*	
16	†	...	†	—	† slightly	†	† under house	†	†	†	†	†	†	...	*	
17	†	†	†	†	† slightly	† slightly	†	†	bad	...	†	†	†	...	†	
18	†	†	†	—	† spouts	† slightly	†	†	—	†	†	†	—	—	†	
19	†	...	†	—	†	†	†	†	†	†	†	†	†	†	*	
20	†	...	— none	—	†	†	†	†	†	...	†	†	†	...	*	

In many instances the yard, where it exists, is defective, and is not impervious to damp. It is very frequently used as a urinal without any precaution to prevent urine from soaking into the soil, or into the wall of the house, a state of things favourable to the propagation of disease.

In the majority of cases the cellars are defective, being in a state of disrepair and dirt, and often damp. Were they completely separated from the house, and well ventilated, this would be of less moment; but owing to the defective state of the ceiling a communication often exists between the cellar and the rooms above.

In a small proportion of the total the cellars are used as day-rooms, and are then, generally, quite unfit for the purpose.

With regard to the day-room accommodation some standard requires to be adopted, and, as already mentioned, having regard to all the circumstances, it does not appear to your Medical Officer of Health that a less allowance of day-room space per bed than 120 cubic feet should be permitted. The actual facts are given for each house in respect of the number of inmates present at the time of the Inspector's visit, and also in respect of the number of beds registered.

As measured by the latter standard, the accommodation provided is in the great majority of cases too little, but it is also in a good many cases inadequate for the number of actual inmates at the time of the Inspector's visit.

In the majority of these houses the interior is damp.

The means of personal cleanliness are nearly always inadequate, even on a mild construction of what is requisite. The provision for ventilation is generally inadequate. No one who has not had occasion to visit these houses at night can adequately realise the fœtor which exists in the bedrooms.

As regards administration, if regard be had to the enforcement of the proper provision of cubic space and to the well ordering of these places in respect of the bedrooms, as regards cleanliness only, it should be stated that, generally speaking, the police have looked fairly well after these matters.

The respects in which administration may be considered to have been deficient are, generally, in making up fireplaces, in the arrangement of beds blocking access to fireplaces, in the soakage of urine into floors, and in the lodgment of spittle on walls. These are confessedly matters not easy to deal with, and they are not mentioned in derogation of the good work which the police have done, but as matters which require attention, and which are very easily overlooked.

If all these defects be weighed, it will be admitted that when they appear in combination they stamp a house as not fulfilling the ordinary conditions of a dwelling-house, which is the standard by which the Local Goverment Board consider that common lodging-houses should be tested. Certainly if we consider the opportunities for infection existing in them, and the high mortality with which they are affected, we cannot well apply to them any lower standard.

Moreover, if we consider the circumstances, character, and habits of the people inhabiting them, we cannot but see that they are more liable to be rendered dirty and to be infected than an ordinary dwelling, so that the facilities for cleansing require to be more complete, so as to render good administration possible.

Statement by Mr. Phillips.

The most interesting statement made by Mr. Phillips (by instruction from Alderman Walton Smith) is based on four visits, each to a number of common lodging-houses, along with the officer of the police force for the district. One of these visits was made at night, in order that he might be able to judge for himself as to the ventilation of the sleeping-rooms. He found that no great fault could be found as regards those conditions of cleanliness which the police could be expected to look after, most of the houses appearing to him to be clean. Many of the closets he found to be in a dirty state; but this he ascribes in a large measure to the bad shape of the seat, which he suggests should be 14 inches long and more oval in shape. If this alteration were made the back of the seat, which is the part usually soiled, would escape contamination. This difficulty does not, he thinks, apply only to lodging-houses, and certainly the suggestion seems a valuable one.

The horrible odour which hangs about the sleeping-rooms in many lodging-houses Mr. Phillips ascribes, and no doubt justly, to the lodgment on the walls of condensed vapours produced in respiration, to the entanglement in them of decomposable particles, and to subsequent decomposition. It is, however, often observable that the heavy burnt odour which is to be noted in the dormitories during the hours of sleep has disappeared when the windows have been thrown open for some time, and only very partially returns when the windows are closed before the dormitories are again occupied. Nevertheless, a suggestion which he makes that these rooms might be more frequently cleaned down by some purifying chemical is a good one, and perhaps as good a chemical as any is the dilute solution of chloride of lime, which might be applied early in the morning to one room after another, as time and opportunity served.

Mr. Phillips' observations on the conveniences used by the lodgers are worthy of special comment. He found that galvanised iron buckets in common use for all the inhabitants of dormitories were sometimes the occasion of the floor being soiled with urine, and he notes that where they have been given up for separate chambers it has been found necessary to place these on the bed, so that the lodgers are made aware of them. On one occasion he found the galvanised pan placed in the middle of a slightly sunken recess in the floor lined with lead, the floor being thus protected from urine.

He observes that a bath is usually unattainable, so that one cannot be surprised that the beds are often dirty, and he makes the following observations with regard to the first series of houses which he examined, 14 in number:—

> "These houses offer beds for 3d. and 4d. per night, the only difference lying in some real or imaginary superiority of room. For these charges the use of the house during the day is included, and also the use of the fire for cooking, hot water for tea, coffee, or cocoa, tea-pots, mugs, plates, &c.
>
> *Character of Lodgers.*
>
> "The people who lodge at these houses are for the most part the lowest class outside the workhouse or the prison; men following grimy trades, street sweepers, gas stokers, engine men, coal heavers, labourers, &c.; others of more cleanly, though not always more honourable professions; thieves, burglars, racing 'spiffs' (I must find more particulars concerning these gentry), and men 'on the look out for a job.' Tramps also frequent these houses; not the tramps who use the casual ward of the workhouse, and have a bath every night, but dirty tramps, who never wash themselves.
>
> "The general practice is to go to bed entirely naked; all their clothing is laid on the bed, above the coverlet, and dirty bodies and dirty heads make havoc with the sheets and pillow cases.
>
> "Very few have socks or stockings—a few rags, 'toe-rags,' are wound about their feet; and from time to time a stranger appears who, after giving 3d. for his night's lodging, tears off a piece of the sheet to make toe-rags.
>
> "Some take up a permanent residence in these houses, and stay there for years; others go to the workhouse in winter, causing a general slackness of lodgers during the colder months.
>
> "The tramping about the house, day-rooms, bedrooms, and kitchens, in muddy boots, makes the cleaning of these houses a work of great labour, and of only momentary efficiency.
>
> "The very annoying and intractable complaint of inability to retain urine during sleep seems not uncommon; in the course of my visit I

saw three sheets that had to be removed and replaced by others from this cause, and there may have been many others which I did not see.

"Many lodgers come with nothing in their possession but 3d. for a bed, and have to leave early and earn a few pence with which to buy a breakfast.

"These items concerning the class of lodgers, when not of my own knowlege, are gathered from conversation with Sergeant Phipps and the keepers of the houses.

Defects of the Premises.

"Next, concerning the houses as buildings, their structural fitness and state of repair, I would observe that those visited are all old houses, past being put into a state of thorough and lasting repair.

"As far as my observation goes, the basements seem often damp, the cellar ceilings sometimes sag down as if the laths were too old and weak to longer support the plaster. On outer walls the plaster has fallen away in places, and attic ceilings have been weakened and disfigured by rain finding its way through roofs and saturating them. Any high gale will be very likely to displace slates and waterspouts, causing further damage to the ceilings below.

"I have attempted to estimate the rent, rates, and taxes of these lodging-houses, for which purpose I have been kindly furnished with a list of gross rentals, assessed value, poor rate, property tax, and water rate of houses accommodating 7,669 lodgers in the aggregate. These data give an average of 0·678d. per head per day on the basis of the registered accommodation. But some houses do not provide the full number of beds for which they are registered, and they are frequently far from full, and are frequently held as weekly houses. These considerations will bring up the average price per actual lodger to ¾d. per head, if not higher. The details of the calculation here follow.

"Houses registered to accommodate 7,669 lodgers:—

	£	s.	d.	£	s.	d.
Gross rental	5,962	17	0			
Rateable value	4,976	0	0			
Rent				5,962	17	0
Poor Rate, 6s. 8d. on £4,976				1,658	13	4
Property Tax:—						
Annual Value	£4,976					
Less 1-6th	829⅓					
8d. in the £ on ... ... = 1-30th.	£4,146⅔ =			138	4	5
Water Rates, as from March, 1899—						
1d. public, 8d. private				155	10	0
				£7,915	4	9

= 0·678d. per head per day, or 1-7th for a house of 22 lodgers.

> "Sergeant Phipps informs me that the landlords frequently raise the rents of these houses. For this there appear to be two strong reasons : (*a*) the constant expense of repairing the old property, and (*b*) the serious loss to the tenant entailed by removal. Under the circumstances, the tenant's most obvious course is to convert as much space as possible into sleeping-rooms, and curtail the portion used as day-rooms."

Mr. Phillips made four visits to different groups of houses—two groups near Deansgate, one in Angel Meadow district, and one in Chorlton-upon-Medlock.

His general impression was that the first-named were in the worst condition, and that those in the last-named district were much the best. I cannot say that I think there is much difference between the two first-named districts.

The Statistical Clerk attached to the Health Department (Mr. Roos) has marked out the position of all these houses on ordnance sheets, which will be useful in showing not only their arrangement, but any action which may be taken in regard to them.

It is proper to mention that the surveillance which the police have exercised with considerable vigilance over those portions of these houses which might be supposed to come more especially under their attention has been lately rendered much more rigorous, and that two officers have been especially detailed for this duty. As one of the consequences, a number of houses have been quite recently brought under my notice as being in a grossly insanitary condition. In view, however, of the generally defective condition of the common lodging-houses, and having regard also to the great labour which has been expended in ascertaining and mapping out their condition, it has appeared to me that, although special attention should be immediately devoted to these houses, some general scheme of action should be mapped out in dealing with all the houses which might, when possible, be applied to these special cases.

Scheme of Action.

In view of the condition of the lodging-houses described, it is desirable that action should be taken for bringing them into line with sanitary requirements. Such action will concern the improvement and rearrangement of those houses which are capable of improvement; the closing of such as are incapable of being rendered reasonably fit for their purpose; and certain additions are suggested to the demands which are ordinarily made on the administration of them.

Where the houses are structurally defective and capable of being made good, the necessary measures should be taken, such as the pointing of walls, repair of roofs, repair of eaves gutters, &c. Sufficient and suitable water-closet provision should be made. Pail-closets are not suited to the inhabitants of these houses; nor where they might be supposed to be suitable are the yards, as a rule, large enough for them. The yards should be rendered truly impermeable to water, and, wherever necessary, urinals should be provided. In all cases such provision should be made that the yards would not be used as urinals. The cellars should be made good and kept clean. The drainage, when defective, should be set right. The day-rooms should be kept clean. They should not be in the cellar, unless the cellar day-room is properly constructed, and sufficiently lighted and ventilated. An adequate provision of day-rooms should be made; sufficient cleansing accommodation of a suitable character should be provided, and a bath with hot and cold water should be put in wherever the number of beds exceeds 25.

The bedrooms should have a reasonable provision of fixed means of ventilation. All internal disrepair should be made good, and the floors should be rendered impervious to damp or dirt.

It is of the utmost importance that floors and ceilings should not be soaked with urine; and if this cannot be structurally prevented, the keeper of a common lodging-house should be obliged first thoroughly to cleanse the floors of the bedrooms, and then to cover them with oilcloth.

As regards administration, wherever the fireplaces are found stuffed up, or beds are placed in front of them so as to impede ventilation, if beds are unduly crowded, or if windows cannot be opened, or if spittle is found on the walls, or urine on the floors, or where the bedclothes are not clean, the keeper of the house should be called to account at once.

It is not sufficient to fulfil the requirement of 300 cubic feet of sleeping room without such room is utilised in a proper manner.

The provision of good and sufficient clean bedclothes should be strictly enforced.

A sufficiency of suitable day-room should be stringently enforced.

An adequate provision of Corporation lodging-houses would be a great gain. Such houses would be constructed so as to give sufficient accomodation and conveniences for health, and they would probably be better administered and more easily controlled than are the lodging-houses at present.

Any one who considers the habits of the inmates of these houses, the diseases from which they suffer, and their high mortality, would not be likely to underrate the importance of such improvements.

A second consideration is that the worst houses could then be suppressed without any harm resulting.

A third is that such model houses would greatly assist in the carrying out of sanitary requirements in the inferior class of lodging-houses.

Medical Officer of Health.

November 15th, 1899.

BAKEHOUSES.

The principles on which alterations are being carried out in the cellar bakehouses of the city have been fully stated in previous reports, and it only remains to give an account of the work done in 1899, which is shown in the following tables:—

BAKEHOUSES CLOSED.

Address	Date
97, Ashton Old Road	January 4th, 1899
14, Milton Street	January 4th, 1899
19, South Porter Street	January 26th, 1899
33, Union Street	February 1st, 1899
338, Stockport Road	February 6th, 1899
383, Rochdale Road	March 4th, 1899
267, Hyde Road	May 19th, 1899
49, Devonshire Street	July 17th, 1899
56, River Street	July 17th, 1899
85, Clowes Street	July 18th, 1899
2a, Scotland	July 24th, 1899
17, Church Street	September 15th, 1899
77, Pollard Street	September 15th, 1899
No. 1 Platform, Victoria Station	September 21st, 1899
11, James Street	September 26th, 1899
42, Little Lever Street	October 5th, 1899
11, Chapel Street	November 15th, 1899
112, Medlock Street	November 15th, 1899

BAKEHOUSES ALTERED.

Address	Name	Date
Valentine Brow	C. Simcock	January 25th, 1899
54, Rusholme Road	John Rogerson	February 10th, 1899
987, Ashton Old Road	S. Attenborough	May 4th, 1899
99, Lower Moss Lane	R. Vickers	May 10th, 1899
89, Stretford Road	Thomas Slack	May 29th, 1899
107, Lower Moss Lane	Herbert Hudson	July 10th, 1899
11, Oldham Street	Inmans Limited	September 28th, 1899
146, Tipping Street	John Jordan	September 8th, 1899
21, Butler Street	Miss Webster	October 4th, 1899
32, Worsley Street	Fredk. Boullen	October 27th, 1899
31, Sackville Street	John Kilvert	December 2nd, 1899
127, Tipping Street	T. Smith	December 4th, 1899

BAKEHOUSES ERECTED DURING 1899.

Address	Name	Date
Clayton Lane and Cycle Street, Clayton	J. W. Bousfield	January 9th, 1899
Hyde Road, West Gorton	J. S. Mottershead	May 16th, 1899
173, Wilmslow Road, Rusholme	J. Beever	July 11th, 1899
Stockport Road, Rusholme	W. Hammond	July 11th, 1899
Lloyd Street, Chester Road, Hulme	T. Kennaugh	December 18th, 1899

THE HOUSING OF THE POPULATION.

To this subject a section was devoted in the Annual Report for 1898, in which the causes of high mortality in Manchester were discussed in reference especially to housing.

The question of housing so as to afford healthy conditions is usually considered purely from the side of arrangement of dwellings and accommodation, but this aspect of the matter does not exhaust the question. It is not of much avail to alter a small part of a large city unless the bulk of the houses are clean, and the ground around them is kept free from pollution. These considerations are essential to a successful solution of the housing question.

Put into practical shape, increased effort is needed (1) to ensure cleanliness in the dwelling. (2) To construct yards and passages so that they are impervious to filth. (3) To carry on the removal of excreta so that the soil in the neighbourhood of dwellings is not polluted. (4) The excellent work done by the House Drainage Department in Manchester will greatly help to purify the soil near dwellings.

As regards the policy pursued by the Sanitary Committee in dealing with the housing question, this has consisted mainly in the condemnation of back-to-back houses, with the conversion of as many of these as possible into through houses, provided with yards and external water-closets.

But as many as five areas have been condemned, the houses pulled down, and tenement blocks, a model lodging-house, and cottages erected on the sites.

The persons thus displaced have numbered 2,663, and the accommodation provided has been for 2,645.

Five small areas have, also, been cleared, and made into open spaces. The aggregate number of houses on these was 111.

In addition, the Sanitary Committee have applied for borrowing powers to carry out a scheme for the erection of workmen's dwellings in the Blackley district, so that dwellings may be erected at a price which will enable artizans displaced by the operations of the Sanitary Committee to transfer their homes to this healthier quarter.

Building has been going on very rapidly in the outer fringe of the city in recent years.

It remains to provide cheap and rapid transit to remove in great measure the housing difficulty, so far as it is capable of solution.

It is only necessary to refer to the figures of the last Census to see that there are elements which are not touched by any schemes.

TOTAL TENEMENTS, AND TENEMENTS WITH LESS THAN FIVE ROOMS, DISTINGUISHING THOSE OCCUPIED BY VARIOUS NUMBERS OF PERSONS. (EXTRACT FROM VOL. II., CENSUS 1891.)

	Rooms in Tenement	Number of Tenements with less than Five Rooms	Number of Occupants of Tenements											
			1	2	3	4	5	6	7	8	9	10	11	12 or more
MANCHESTER	1	1,604	497	620	252	109	65	23	16	12	7	2	1	0
	2	10,057	941	2,581	2,190	1,839	1,215	750	351	134	45	10	0	1
	3	5,356	208	901	990	934	791	664	432	264	111	41	17	3
	4	40,446	713	5,603	7,090	7,274	6,525	5,299	3,659	2,371	1,130	525	175	82

Total Tenements, 103,720.

At that time about 5 per cent. of the houses were empty, the period being one of depression. Yet that there was then serious overcrowding is easily seen by glancing over the Census figures.

The above table shows that the smaller the dwelling the greater is the tendency to overcrowding. This may be partly explained by the fact that the poorer the people are, the smaller is the house which they can afford. But this is not the entire explanation, the fact being that many families occupy small dwellings who can afford a larger one from mere use and wont. It may, on first thoughts, seem strange that there should be so much overcrowding at a period when there were so many empty houses. But the fact is that in hard times people tend to crowd together so as to lighten expense. In prosperous times there is a less tendency in this direction until all the houses have been occupied.

If, therefore, it is desired to attack the problem of overcrowding, it is probable that this could be more easily done in a period of prosperity than in a period of adversity.

There is a great reluctance to deal with the question of overcrowding, and very naturally so.

A broad practical distinction might, however, be adopted.

Where a young family dependent on the parents is growing up, the question of overcrowding must of necessity be gently approached. Where, on the other hand, there is marked overcrowding in the case of a family with adolescents earning wages sufficient to enable the household to shift to a more roomy house, pressure to remove should be firmly exerted.

It is, perhaps, necessary to point out that the policy of condemning and reconstructing an area is not an alternative to dealing piecemeal with isolated dwellings or isolated groups of dwellings unfit for human habitation, and that the two procedures cannot be supposed to replace each other.

At present the whole subject is suspended pending further consideration by the Sanitary Committee, and I have therefore obtained, by the kindness of Mr. Moyes and Mr. Rook, a summary of the operations of the Improvement and Buildings Department and of the Sanitary Department since 1891, which is incorporated in the tables on pages 165 and 166.

It will be perceived that these tables do not coincide in point of time, the sanitary return covering ten years, the new buildings return covering nine years.

STATEMENT AS TO THE NUMBER OF DWELLING-HOUSES CERTIFIED AS FIT FOR HUMAN HABITATION IN THE VARIOUS DIVISIONS OF THE CITY BETWEEN 1890 AND 1899.

DISTRICT	1st Nov., 1890, to 31st Oct., 1891	1891 to 1892	1892 to 1893	1893 to 1894	1894 to 1895	1895 to 1896	1896 to 1897	1897 to 1898	1898 to 1899	TOTALS
Ancoats	31	195	54	70	7	97	113	53	25	645
Central .... St. George's ...	NOTE:—193 Artisans' Dwellings	...	...	...	...		...	...	..	193
Cheetham	8	38	76	97	37	155	269	370	315	1,365
Crumpsall	17	7	18	24	44	39	37	41	18	245
Blackley.........	29	11	13	5	19	41	31	56	67	272
Harpurhey......	55	60	60	170	191	342	253	346	327	1,804
Moston	22	12	74	89	148	193	225	263	248	1,274
Newton	40	20	10	30	65	140	96	136	134	671
Bradford	36	39	49	21	65	67	198	91	103	669
Beswick	2	8	15	8	...	97	118	128	98	474
Clayton	6	61	6	9	39	111	152	161	229	774
Ardwick	4	34	25	59	177	261	192	295	361	1,408
Openshaw	177	169	65	15	60	69	71	152	119	897
Gorton	178	110	30	2	2	20	87	236	178	843
Rusholme	51	37	76	89	211	277	294	354	486	1,875
C.-on-M.	26	97	97	88	18	36	46	57	1	466
Hulme	...	2	1	1	...	29	24	4	3	64
City Totals ...	682	1,093	669	777	1,083	1,974	2,206	2,743	2,712	13,939

RETURN SHOWING THE NUMBER OF HOUSES CLOSED, DEMOLISHED, OR ADDED TO OTHER HOUSES, THEREBY BEING DISCONTINUED AS SEPARATE HABITATIONS, ON THE RESPECTIVE SANITARY DISTRICTS IN EACH YEAR FROM 1890 TO 1899—(JANUARY TO DECEMBER IN EACH YEAR).

SANITARY DISTRICTS	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	TOTALS
Ancoats	33	43	50	63	120	259	161	64	49	70	912
Central	36	74	197	83	164	131	43	41	21	66	856
St. George's	28	...	102	14	164	65	7	113	2	133	628
Cheetham	1	...	4	...	...	...	...	3	14	1	23
Crumpsall	...	...	...	...	...	...	...	...	...	...	...
Blackley...........	...	5	...	...	...	1	...	...	...	...	6
Harpurhey.........	7	...	...	...	...	...	...	...	...	...	7
Moston	...	...	...	...	..	...	...	...	...	...	...
Newton Heath ...	...	37	3	...	25	...	30	4	15	6	120
Bradford	...	4	1	...	...	...	...	...	13	16	34
Beswick	...	...	...	...	...	...	...	...	...	...	...
Clayton	...	...	...	...	...	...	..	...	...	...	...
Ardwick	16	4	14	22	...	...	...	...	10	...	66
Openshaw	...	...	...	3	...	2	...	...	1	1	7
West Gorton	...	9	18	...	...	4	2	...	1	5	39
Rusholme & Kirk.	...	4	9	3	...	...	...	...	...	...	16
C.-on-M.	31	53	44	118	...	144	42	31	43	29	535
Hulme	11	27	31	104	213	2	136	2	16	10	552
City Totals.........	163	260	473	410	686	608	421	258	185	337	3801

? What number was closed from 1880–90

The actual difference in the number of dwellings dealt with by the Unhealthy Dwellings Committee and the number of newly-inhabited houses is over 10,000, and if we add on 2,000 for the last year, we get an excess of new buildings over houses demolished or converted as a result of the operations of the Sanitary Committee of 12,000 houses, representing a population of 60,000. It is probable that other operations, such as improvement schemes, conversion of dwelling-houses into business premises, etc., will not affect a population exceeding 4,000 persons.

There would thus remain an increase of population of 56,000, or nearly 10,000 in excess of the Registrar-General's estimate. But there is much uncertainty as to the number of houses removed for private schemes.

It will be noted that we do not possess information enabling us to state accurately what have been the changes in each district. But this information it should be possible to collect year by year after the next Census, and arrangements should be made to that end.

It will be seen from the returns that building operations have been especially active in Cheetham, Harpurhey, Moston, Ardwick, and Rusholme, that is to say, generally, on the outer fringe, and from this we may infer that the working classes have themselves adopted the outward movement.

The following table, which I am enabled to give by the kindness of my fellow Medical Officers of Health, shows that there is a slackening in the aggregate of new houses occupied in Manchester and Salford and the surrounding district. A comparison of the separate items with those given in the Report for 1898 shows that this extends to all the surrounding districts; while in the City of Manchester the number of new houses occupied is about the same in 1898 and 1899 :—

1899. NEW HOUSES CERTIFIED IN OUTSIDE DISTRICTS.

Salford	885
Eccles	202
Withington Urban District Council:—	
Withington, including Whalley Range	225
Didsbury	139
Burnage	1
Chorlton-cum-Hardy	55
Stretford	262
Moss Side	35
Levenshulme	290
Droylsden	36
Urmston	43
Gorton	411
	2584

LEGISLATION AS TO PERSONAL CLEANLINESS.

From the Report of the Ladies' Health Society it will be seen that a very large number of children have been found in a state of squalor and neglect. In several instances I have been consulted by relatives in reference to inmates of their households who have sunk into a state of hopeless filth, and who could not be roused to do anything. I have been quite unable to help them.

Even permissive legislation—allowing Corporations to make regulations to enforce personal cleanliness, and for that purpose to prosecute defaulting guardians of children, and to provide a temporary home for persons who have sunk into a sordid state of filth—would be valuable.

EFFLUVIUM NUISANCES.

During the years 1898 and 1899, numerous complaints were received from Miles Platting in reference to nuisances arising from the drains and pervading the atmosphere. The former were believed to be in connection with the chemical works in the district, as were in part the latter. The Sanitary Committee took very great pains to ascertain what the facts were, and, on the representation of 12 inhabitants of the district, instituted proceedings.

As a result, one of the manufacturers was convicted and fined.

Another source of effluvia was the Corporation Manure Works, but the Cleansing Department called in expert advice, and made changes which promise to do away with the nuisance. A firm in Philips Park Road, engaged in chemical manufactures, was prosecuted on account of the production of offensive effluvia, and fined.

A firm engaged in the production of artificial manure, off Ashton New Road, was also accused in the autumn of 1899 of causing a nuisance, and has since been prosecuted, convicted, and fined.

The measures taken in this instance would appear to have considerably reduced the nuisance.

Proceedings were also taken against the Corporation of Oldham in consequence of numerous complaints by the inhabitants of New Moston of a serious nuisance caused by the nightsoil depôt of the Corporation at Hollinwood. A conviction was obtained and an Order made to abate.

THE DANGER OF THE IMPORTATION OF PLAGUE.

The plague has all but made an entrance into this country on several occasions in recent years. The only effectual barrier against it is the vigilance of the Port Sanitary Authorities and of the Medical Officers of the Local Government Board. One chief danger is that it may creep in as a slight form of illness, which may go on extending for a while without any fatality until it is too late to prevent its spread. Another danger is that it may be imported by rats which have become infected on the voyage from other rats or from infected persons.

The expert bacteriologist, fortunately, is able to tell in the case of an individual whether he is suffering from the plague, and the disease can also be diagnosed by him in the rat.

It thus becomes a question of vigilance on the part of the Medical Officer of the Port Sanitary Authority in preventing the landing of suspicious persons or things, or, in case of suspicion, taking measures against the escape of rats from a vessel in port.

It is only when the Port Sanitary Officers have been passed that we should be called upon to act.

Supposing our vigilance evaded, it must be admitted that there are sufficient rats in Manchester to carry the disease from one part of the city to another.

The danger does not appear to be imminent, but the necessity for care is pressing, as the disease has lately been prevalent in China, India, and Australia, and has visited the Mauritius. Fortunately, Dr. Crocker may be relied upon to see that no possible precaution is omitted.

Great vigilance has been shown by the Medical Officers of the Local Government Board in the investigation of cases reaching these shores, and in taking precautions against the introduction of the disease.

Since this was written, plague has made its appearance in Glasgow, and a circular has been issued reminding medical practitioners of the chief features of this insidious disease.

WORK OF THE LADIES' HEALTH SOCIETY AND THE LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

The following table shows the amount of work these Societies have done during the year 1899.

Work of Female Health Visitors, Year ending 31st December, 1899.

(a) LADIES' HEALTH SOCIETY.

DISTRICT	Number of Cottages in District	HOUSES VISITED		CONDITION OF HOUSES							No. of Houses containing Lodgers	Complaints requiring action by Sanitary Department	SICKNESS			Leaflets left at Houses	Disinfecting Powder left at Houses	LIMEWASHING								Reports as to Children being Neglected (clothing, food, &c.)	Help Rendered	Death Cards	Average Death-rate
		First Visit	Not First	Dilapidated	Not Dilapidated	Clean	Dirty	Improved since last Visit	Not Improved	Overcrowded			Infectious	Non-Infectious	Total Sickness			Living and Bed Rooms	Kitchens	Yards	Closets	Cellars	Coal-places	Ceilings	Staircases		Help rendered includes :—Giving food, clothing, &c., advising mothers as to care and treatment of children, making of sick beds, cleaning houses for sick persons, obtaining recommends for Convalescents, &c.		
1. Ancoats, West	1434	34	1781	9	1806	1759	56	136	62	10	203	68	68	708	776	1631	1754	81	20	28	21	7	2	22	1	1	130	146	42·0
2. Ancoats, North	2137	638	1070	34	1701	1544	164	474	565	2	32	70	24	314	338	1759	1679	130	59	120	117	11	11	163	25	10	202	195	30·7
3. Ancoats, Central	1021	217	1841	25	2033	1772	286	575	1	3	81	39	54	662	716	2032	2037	203	105	167	150	8	15	341	24	27	362	101	39·2
4. Ancoats, South	1398	280	1739	24	1995	1282	737	651	591	14	346	60	80	579	659	2472	1948	285	309	436	428	46	98	137	26	103	457	118	32·7
5. Ancoats, East	1166	375	1780	11	2144	2112	43	312	3	1	16	24	29	300	329	2155	2139	45	21	12	...	2	...	6	...	...	84	97	29·2
6. London Road	1820	152	2121	235	2038	2016	257	686	1404	22	529	96	77	502	579	2582	2255	213	67	253	229	21	16	270	13	90	249	157	34·0
7. Deansgate	1705	72	2007	24	2055	1571	508	396	1610	11	375	96	28	345	373	2117	1515	212	119	234	233	20	10	32	49	13	135	147	35·3
8. St. George's, North	3052	466	1281	31	1716	1700	47	413	865	4	155	109	35	371	406	1231	1642	34	23	15	17	3	2	12	...	6	146	188	26·8
9. St. George's, East	1421	...	2397	94	2303	2337	60	674	1723	...	115	84	73	281	354	2397	2387	53	383	49	23	10	...	...	2	1	175	210	25·1
10. St. George's, Central	1422	56	1374	27	1403	1356	74	168	5	18	266	114	32	218	250	1169	1058	188	46	18	18	5	...	232	...	21	130	138	39·2
11. Angel Meadow	1023	259	1150	75	1334	1311	98	162	103	4	247	52	19	305	324	1439	1265	10	7	8	2	1	...	1	1	41	132	66	50·9
12. Chorlton-upon-Medlock, North.	1808	321	1588	7	1902	1749	160	130	13	1	286	35	41	263	304	2083	1825	29	16	19	15	5	2	31	11	...	226	196	32·9
13. Chorlton-upon-Medlock, South.	893	480	1533	2	2011	1720	293	247	1283	5	356	59	23	381	404	2030	2009	87	114	118	96	36	...	93	6	18	333	176	25·4
14. Hulme, West	830	777	1478	202	2053	2123	170	794	198	4	368	119	40	568	608	2162	1741	158	131	164	120	42	...	223	34	34	217	49	34·7
15. Hulme, Central	3288	1207	636	26	1817	1736	107	353	64	1	294	52	23	369	392	2048	1832	26	47	116	79	8	3	24	...	37	112	284	28·8
16. Hulme, East	1134	255	1885	30	2110	1389	751	57	14	4	519	42	24	543	567	1871	1669	79	27	49	52	11	3	36	22	90	498	105	34·8
TOTAL	25552	5589	25661	856	30421	27477	3811	6228	8504	104	4188	1119	670	6709	7379	31178	28755	1833	1494	1806	1600	236	162	1623	214	492	3588	2373	33·9

(b) LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

DISTRICT	Number of Cottages in District	First Visit	Not First	Dilapidated	Not Dilapidated	Clean	Dirty	Improved since last Visit	Not Improved	Overcrowded	No. of Houses containing Lodgers	Complaints requiring action by Sanitary Department	Infectious	Non-Infectious	Total Sickness	Leaflets left at Houses	Disinfecting Powder left at Houses	Living and Bed Rooms	Kitchens	Yards	Closets	Cellars	Coal-places	Ceilings	Staircases	Reports as to Children being Neglected (clothing, food, &c.)	Help Rendered	Death Cards	Average Death-rate
17. Red Bank	657	28	814	46	823	828	41	24	11	4	61	183	7	104	111	847	858	3	2	6	1	2	...	1	1	...	88	...	17·3
18. Strangeways	394	108	1122	23	1207	1063	167	163	236	7	654	273	18	208	226	692	1169	6	19	49	40	10	...	6	...	...	97	...	18·5
TOTAL	1051	136	1936	69	2030	1891	208	187	247	11	715	456	25	312	337	1539	2027	9	21	55	41	12	...	7	1	...	185	...	17·9
GRAND TOTAL	26603	5725	27597	925	32451	29368	4019	6415	8751	115	4903	1575	695	7021	7716	32717	30782	1842	1515	1861	1641	248	162	1630	215	492	3773	2373	32·1

The work performed by these Societies for a number of years in teaching personal and household cleanliness in the poorer districts of the city has had a marked effect in these districts, and an improvement on former conditions can now generally be discerned. At the same time there is still much to be done to counteract the bad habits of many of those who occupy the slums of our city. The Medical Officer of Health desires here to acknowledge the valuable services rendered by the lady officers and district lady superintendents of the Societies in guiding and aiding the work of the Female Health Visitors, and for the sympathy which they manifest in their work amongst the poor. A perusal of the table shows a large record of work.

The Health Visitors have made 23,322 inspections of houses in the course of systematic house-to-house visitation in their respective districts. They have also made 2,373 special enquiries in cases of death, and noted 1,690 complaints as to insanitary conditions which they have detected in the course of their daily work.

They have distributed no fewer than 32,717 leaflets on the following matters:—

1. The prevention of diarrhœa.
2. The prevention of consumption.
3. Precautions against measles.
4. Precautions against whooping cough.
5. Suggestions to householders.
6. How infants should be fed, &c.

By the distribution of the leaflets a system of educational work is constantly going on amongst the poor.

Disinfecting powder has been left at 30,782 houses.

Several tons of soap have been sold to the poorer inhabitants, and the importance of cleanliness of their houses and persons is steadily inculcated.

Limewashing.—The visitors supply brushes, on loan, and give the necessary sanitary dry lime to tenants of houses who will undertake cleansing. During the year they have been enabled to get 9,114 rooms, yards, closets, &c., thoroughly cleansed and limewashed. To this portion of their work the Medical Officer of Health attaches great importance.

In the course of their daily visits they came across 492 cases of neglected children. The parents were warned in many instances, and others were reported to the Society for the Prevention of Cruelty to Children.

Help was rendered to 3,773 families in many ways, such as in food and clothing, advising mothers as to the management of their children, making the beds of sick patients and cleaning their houses, obtaining recommends for

Convalescent Homes, and in the summer months arranging to send children into the country for a holiday, and to the Manchester Camps for Poor Children at the Seaside.

During the year they have undertaken another very important work, viz., supervising the disinfection of houses in cases of consumption, and seeing to their subsequent cleansing, and with one or two exceptions this work is carried out to my entire satisfaction. At the present time they have 235 cases of consumption under observation in their respective districts. It is their duty to report monthly as to whether the house is clean and free from dust and dirt, and every three months they see that a thorough cleansing of the house takes place, so as to keep down infective material as much as possible, viz., the walls are rubbed down with dough, the floors and furniture washed, and the bed clothing and personal clothing of the patient washed in boiling water.

WORK BY THE SPECIAL JEWISH HEALTH VISITOR.

In August, 1899, the Sanitary Committee, in consequence of an application from the late Rev. L. M. Simmons, on behalf of the Jewish Ladies' Health Society, resolved to pay for an additional Visitor to be attached to that Society, but to be under the direction of the Medical Officer of Health, and to give her whole time to the sanitary work for which she was engaged.

Miss Blumenthal was appointed, and in accordance with the views of the committee a special district, including Lord Street, Fernie Street, Verdon Street, and Scotland, and the intermediate streets, was assigned to her.

This was about the worst Jewish quarter in the city, and her allotted task was to get rid of the squalor and filth of the houses and shops. With the guidance of the Medical Officer of Health at the outset of her work, and later with the help of Inspector Gray, she has succeeded to an extent which your Medical Officer of Health did not expect.

The complete success of this experiment is a great encouragement to similar efforts elsewhere.

MONSALL HOSPITAL.

Report for the Year 1899. By Dr. R. W. Marsden.

The unusual prevalence of enteric fever at the end of 1898 was continued during the first three months of 1899. The usual autumnal epidemic, however, was during this year very slight, so that during the five months from August to December it will be seen that only 112 cases of this disease were admitted, whilst during the corresponding period in the previous year there were no fewer than 268 cases. Similarly, the relatively low morbidity for scarlet fever which had been maintained almost throughout the year 1898 was continued during the first four months of 1899, and was only slightly increased during the succeeding four months. Between September and December, however, and including both of these months, there occurred a very distinct increase in the number of cases admitted suffering from this disease. A glance at the table showing the monthly distribution of the various diseases shows that, as compared with the four months immediately preceding, twice as many cases per month were admitted. As regards diphtheria, the total number of cases treated has been distinctly above the average. This increase was, however, especially marked during the months October, November, and December, no less than 60 of the 126 cases occurring in that quarter; in fact, if the two months January and April be excepted, when 18 and 14 cases respectively were admitted, the morbidity for the rest of the year will be seen to have been excessively low, as for the remaining seven months, only 34 cases are to be counted.

Turning now to the mortality for the different diseases, it will be seen that, as compared with 1898, the percentage death-rate for diphtheria has undergone practically no change. On the other hand, it is interesting to note that the total percentage mortality for all cases has been less than in any previous year. This is evidently due to the low mortalities for scarlet fever and enteric fever, viz., 3·6 per cent. and 12·3 per cent. respectively. The table which I have included, showing the death-rates for these diseases since 1890, shows that these two figures are the lowest yet recorded. I am not aware of any change in treatment which could account for this improvement compared with the years preceding, so that I think the lowered mortalities must be attributed to a greater mildness in the type of the disease in each instance. It is, however, gratifying to be again able to report that we have been successful in saving the life of one patient by means of laparotomy for perforation of the intestine during an attack of enteric fever.

The hospital staff are, of course, not exempted from the contraction of the various infectious diseases. During 1899 five nurses suffered from enteric fever and six from scarlet fever, all of whom recovered. The year has, however, been remarkable for the unusual prevalence of diphtheria amongst the staff. No less than 15 instances occurred, one of which terminated fatally. In addition, cases of sore throat, which could not be attributed with certainty either to diphtheria or scarlet fever, have been very frequent. These cases have been of very different degrees of severity, but fortunately all recovered.

STATISTICAL REPORT FOR THE YEAR 1899.

Remaining in Hospital January 1st, 1899	234
Patients Admitted during 1899	1771
	2005

Discharged.

Cured and Died..	1559
Remaining in Hospital December 31st, 1899..........	446
	2005

Total Number of Deaths during 1899..................	126
Net Mortality	7·11°/o

Of the deaths, 16 occurred within 48 hours of admission (6 male, 10 female).

Daily Averages.

Patients	248·45
Nurses and Servants	115·52
Officers..	6·13
Daily average stay, in days............................	55·51

SHOWING MONTHLY DISTRIBUTION OF PRINCIPAL DISEASES ADMITTED THROUGHOUT THE YEAR.

1899	Scarlatina	Diphtheria	Enteric Fever	Morbilli	Pneumonia	Erysipelas	Unclassified	Total	Daily Average Number of Patients in Hospital
January ...	53	18	43	6	2	2	7	131	230·6
February..	51	4	35	1	1	2	15	109	229·3
March ...	30	2	20	1	4	1	5	63	193·4
April	48	14	12	2	3	1	10	90	152·1
May	73	3	20	2	3	1	14	116	164·6
June	89	8	15	5	4	0	6	127	192·03
July	95	6	10	2	6	0	5	124	219·7
August ...	85	8	13	0	0	2	2	110	217·6
September	157	3	34	1	1	2	2	200	244·5
October ...	173	13	23	2	1	1	7	220	328·5
November	183	18	26	1	3	2	8	241	399·6
December.	168	29	16	5	3	1	18	240	439·1
Total	1205	126	267	28	31	15	99	1771	250·91

SHOWING NUMBER OF VARIOUS DISEASES.

DISEASE	REMAINING IN HOSPITAL, JAN. 1ST, 1899	ADMITTED TO DEC. 31ST, 1899	DISMISSED, CURED, AND DIED DURING 1899	REMAINING IN HOSPITAL, DEC. 31ST, 1899
Scarlatina	120	1205	963	362
Diphtheria	18	126	118	26
Enteric Fever..............	85	267	320	32
Pneumonia	5	31	35	1
Erysipelas	...	15	14	1
Morbilli	1	28	25	4
Unclassified	5	99	84	20
Total...	234	1771	1,559	446

SCARLATINA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent	Ad-mitted	Died	Mor-tality per cent.
Under one year...	...	...	...	5	1	20	5	1	20
1 to 2 years...	13	1	7·6	11	3	27·2	24	4	16·6
2 to 3 „ ...	32	6	18·7	38	1	2·6	70	7	10
3 to 4 „ ...	56	7	12·5	54	3	5·5	110	10	9·09
4 to 5 „ ...	63	1	1·5	68	5	7·3	131	6	4·5
5 to 10 „ ...	219	5	2·2	272	6	2·2	491	11	2·24
10 to 15 „ ...	128	2	1·5	102	1	0·9	230	3	1·3
15 to 20 „ ...	31	...	...	31	1	3·2	62	1	1·6
20 to 25 „ ...	21	...	...	24	...	...	45	...	...
25 to 30 „ ...	7	1	14·2	15	...	...	22	1	4·5
30 to 35 „ ...	3	...	...	5	...	...	8	...	...
Over 35 „ ...	3	...	...	4	...	...	7	...	...
Total	576	23	3·9	629	21	3·3	1205	44	3·6

Two deaths occurred within 48 hours of admission.

PERCENTAGE COMPLICATIONS DURING SCARLATINA.

AGE OF PATIENTS	Albumin.	Hæmorrhagic Nephritis	Nephritis	Otitis	Adenitis	Synovitis	Sc. Anginosa	Rhinitis
Under one year	...	...	...	...	...	...	...	20
1 to 2 years	8·3	...	8·3	24·9	16·6	...	...	49·9
2 to 3 „	4·2	...	4·2	18·5	17·0	1·4	...	51·2
3 to 4 „	8·1	3·6	3·6	22·7	19·9	...	2·7	43·8
4 to 5 „	3·8	3·8	1·5	22·0	14·5	0·76	...	40·3
5 to 10 „	6·1	4·6	2·2	14·9	11·82	1·02	0·2	34·12
10 to 15 „	4·3	3·4	3·9	7·8	11·5	1·3	...	19·5
15 to 20 „	6·4	...	9·12	6·4	9·12	3·6	1·6	19·3
20 to 25 „	6·6	2·2	...	4·4	4·4	4·4	...	6·6
25 to 30 „	...	13·6	...	4·5	4·5	...	...	9·09
Over 30 „	...	6·6	...	...	6·6	...	...	...

ENTERIC FEVER.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.
Under one year...	...	...	...	...	...	...	...	...	...
1 to 2 years...	...	...	...	...	...	...	...	...	...
2 to 3 „ ...	...	...	...	...	...	...	...	...	...
3 to 4 „ ...	4	...	...	4	...	...	8	...	...
4 to 5 „ ...	2	...	...	3	...	...	5	...	...
5 to 10 „ ...	16	1	6·25	18	2	11·1	34	3	8·8
10 to 15 „ ..	25	...	...	25	...	...	50	...	...
15 to 20 „ ...	23	5	21·7	13	3	23·07	36	8	22·2
20 to 25 „ ...	31	7	22·5	18	1	5·5	49	8	16·3
25 to 30 „ ...	22	6	27·3	15	...	...	37	6	16·2
30 to 35 „ ...	17	3	17·6	8	2	25	25	5	20·0
35 to 40 „ ...	4	1	25	3	2	66·6	7	3	42·8
40 to 45 „ ...	4	...	...	2	...	...	6	...	...
45 to 50 „ ...	5	...	...	1	...	...	6	...	...
Over 50 „ ...	3	...	...	1	...	...	4	...	...
Total...	156	23	14·7	111	10	9·00	267	33	12·3

Two deaths occurred within 48 hours of admission.

PERCENTAGE COMPLICATIONS DURING ENTERIC FEVER.

Age of Patients	Diarrhœa	Constipation	Hypostatic Pneumonia	Bronchitis	Relapse	Intestinal Hæmorrhage	Perforation	Delirium	Cystitis	Neuritis
Under 1 year	...	...	...	...	...	...	...	...	...	...
1 to 2 years	...	...	...	...	...	...	...	...	...	...
2 to 3 „	...	...	...	...	...	...	...	...	...	...
3 to 4 „	...	37·5	...	25·0	...	...	...	...	...	...
4 to 5 „	40·0	20·0	...	...	...	...	...	...	...	...
5 to 10 „	5·8	38·2	5·6	17·6	2·9	2.9	...	...	2·9	5·8
10 to 15 „	2·0	32·0	2·0	12·0	6·0	2·0	...	2·0	...	4·0
15 to 20 „	19·4	22·2	11·0	22·2	8·3	11·4	5·5	...	...	...
20 to 25 „	18·3	14·2	2·04	12·2	10·2	2·04	2·04	2·04	...	...
25 to 30 „	2·7	21·6	2·7	18·9	...	5·4	10·9	2·7	...	2·7
30 to 35 „	8·0	36·0	...	12·0	8·0	8·0	4·0	...	4·0	...
35 to 40 „	14·2	...	...	57·1	...	14·2	...	14·2	14·2	...
Over 40 „	6·2	12·5	...	6·2	...	6·2	...	6·2	...	...

MORBILLI.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.
Under 1 year......	1	1	100	...	...	...	1	1	100
1 to 2 years ...	1	...	...	1	1	100	2	1	50
2 to 3 „ ...	4	...	...	2	...	...	6	...	...
3 to 4 „ ...	5	3	60	1	...	...	6	3	50
4 to 5 „ ...	3	1	33·3	...	...	...	3	1	33·3
5 to 10 „ ...	3	...	...	1	...	...	4	...	...
10 to 15 „ ...	5	...	...	1	...	...	6	...	...
15 to 20 „ ...	...	...	...	...	...	...	...	...	...
20 to 25 „ ...	...	...	...	...	...	...	...	...	...
25 to 30 „ ...	...	...	...	...	...	...	...	...	...
Total...	22	5	22·7	6	1	16·6	28	6	21.4

One death occurred within 48 hours of admission.

ERYSIPELAS.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.
Under 5 years ...	...	...	...	...	...	...	...	...	...
5 to 10 years ...	...	...	...	...	...	...	...	...	...
10 to 15 „ ...	1	...	...	1	...	...	2	...	...
15 to 20 „ ...	...	...	...	1	...	...	1	...	...
20 to 25 „ ...	1	...	...	...	...	...	1	...	...
25 to 30 „ ...	1	...	...	...	...	...	1	...	...
30 to 35 „ ...	1	...	...	1	...	...	2	...	...
35 to 40 „ ...	...	...	...	...	...	...	...	...	...
40 to 45 „ ...	...	...	...	1	...	...	1	...	...
45 to 50 „ ...	1	...	...	3	...	...	4	...	...
Over 50 „ ...	3	...	...	...	...	...	3	...	...
Total...	8	...	...	7	...	...	15	...	...

PNEUMONIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Admitted.	Died.	Mortality per cent.	Admitted.	Died.	Mortality per cent.	Admitted.	Died.	Mortality per cent.
Under 5 years ...	3	...	...	7	1	14·2	10	1	10
5 to 10 „ ...	2	...	...	2	1	50	4	1	25
10 to 15 „ ...	1	...	...	2	...	...	3	...	...
15 to 20 „ ...	4	...	...	2	1	50	6	1	16·6
20 to 25 „ ...	...	...	...	1	...	...	1	...	...
25 to 30 „ ...	1	1	100	...	...	...	1	1	100
30 to 35 „ ...	1	...	...	...	...	...	1	...	...
35 to 40 „ ...	...	...	...	2	1	50	2	1	50
40 to 45 „ ...	...	...	...	1	...	...	1	...	...
45 to 50 „ ...	...	...	...	...	...	...	...	...	...
Over 50 „ ...	1	...	...	1	...	...	2	...	...
Total ...	13	1	7·6	18	4	22·2	31	5	16·1

One died within 48 hours of admission.

UNCLASSIFIED.

DISEASE	MALE	FEMALE	DISEASE	MALE	FEMALE
			Brought forward...	14	23
Tonsillitis	1	13	Hæmorrhagic Nephr.	1	...
Laryngitis	2	1	Gastro Enteritis	1	...
Sorethroat	...	2	Hysteria	1	1
Strumous Adenitis ...	1	...	Rötheln	1	5
Suppr. Adenitis	1	...	Varicella	3	...
Mastitis	...	1	Scabies..................	1	1
Pleuritis	1	...	Febricula..............	1	...
Empyema..............	1	...	Puerperal Fever	...	9
Diabetes	1	...	Tuberc. Ankle.........	...	1
Colitis	...	1	,, Abscess of Brain	1	...
Periostitis..............	...	1	Suppr. Bursitis.........	...	1
Tuberc. Peritonitis ...	1	1	Suppr. Right	...	1
Cervical Periostitis ...	1	...	Lachrymal Sac.........		
Meningitis	1	1	Subcutaneous	1	...
Pelvic Cellulitis	...	1	Abscess in Sacral		
Suppr. Cellulitis	2	1	Region..............		
Perineal Abscess......	1	...			
Carried forward......	14	23	Total...	25	42

Patients with no stated illness 32
Patients unclassified 67

Total...99

Patients cured 89
Patients died (3 male and 7 female) 10

Total...99

Net Mortality on Unclassified Cases ....10·1

CASE MORTALITY FOR 1892-99.

Year 1892	12·32	Year 1896	10·60
„ 1893	9·36	„ 1897	8·60
„ 1894	7·82	„ 1898	10·70
„ 1895	9·73	„ 1899	7·11

Total average Case Mortality for the last eight years—9·53.

YEAR	DISEASE	MORTALITY PER CENT.	YEAR	DISEASE	MORTALITY PER CENT.
1890	Scarlatina	12·2	1890	Enteric fever	16·4
1891	Do.	6·9	1891	Do.	19·1
1892	Do.	9·1	1892	Do.	19·1
1893	Do.	6·9	1893	Do.	18·6
1894	Do.	4·4	1894	Do.	15·9
1895	Do.	7·1	1895	Do.	20·1
1896	Do.	8·5	1896	Do.	19·6
1897	Do.	6·1	1897	Do.	13·3
1898	Do.	6·7	1898	Do.	16·1
1899	Do.	3·6	1899	Do.	12·3

DIPHTHERIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality percent.	Admitted	Died	Mortality percent.	Admitted	Died	Mortality per cent.
Under 1 year ...	3	1	33·3	1	...	...	4	1	25
1 to 2 years ...	7	3	42·7	6	1	16·6	13	4	30·7
2 „ 3 „ ...	2	1	50	2	2	100	4	3	75
3 „ 4 „ ...	9	3	33·3	6	2	33·3	15	5	33·3
4 „ 5 „ ...	7	2	28·5	7	1	14·2	14	3	21·4
5 „ 10 „ ...	15	2	13·3	19	7	36·8	34	9	26·4
10 „ 15 „ ...	9	1	11·1	8	1	12·5	17	2	11·7
15 „ 20 „ ...	3	...	...	6	...	...	9	...	...
20 „ 25 „ ...	1	...	...	8	...	...	9	...	...
25 „ 30 „ ...	...	...	...	4	...	...	4	...	...
30 „ 35 „ ...	...	...	...	...	...	...	...	...	...
Over 35 years ...	2	1	50	1	...	...	3	1	33·3
Total	58	14	24·1	68	14	20·5	126	28	22·2

It has been the custom, since the adoption of the bacteriological examination of the throat, to include as diphtheritic all cases where the Klebs-Löffler bacillus could be cultivated, even though no evidence of the formation of a membranous deposit could be detected.

Included in the 98 cases which recovered, therefore, are 19 such instances. Of these 19 patients, 3 had laryngeal obstruction, for which tracheotomy was necessary, though no membrane was observed in the throat or the trachea, 1 had sore throat due to secondary syphilis, in another the symptoms were those of a croupous pneumonia, whilst yet another was an old man with atheroma and suppurative cellulitis of the forearm. In the remaining 13 cases there was congestion of the throat, but no clinical evidence diagnostic of the disease, and in only one of these 19 patients did the urine contain more than a large trace of albumen, this isolated case being one of the tracheotomies above mentioned.

Turning now to the other 79 cases, the urine was examined in 72, and in 50 it was either free from albumen, or contained not more than a large trace, while in 22 a larger or smaller deposit was found on boiling.

It is interesting to contrast the fatal cases with the above, for one finds that in only two instances was the amount of albumen so small as not to form a deposit on boiling, and in these two cases death was in one due to broncho-pneumonia after tracheotomy, and in the other to asphyxia, unrelieved by tracheotomy, the diphtheritic formation having occurred below the site of operation.

It is generally conceded that the administration of antitoxin may have an irritating effect upon the kidneys, and an examination of the 98 cases which recovered shows that though in 44 instances no increase in the amount of albumen occurred after the lapse of one or two days from the injection, but rather a sudden or gradual improvement, yet in 21 instances at the end of the 1st week, or during the 2nd week, an increase took place. This increase was variable in degree, and in all cases only of temporary duration, disappearing again usually by the end of the 3rd week.

Though rashes, generally of an urticarial character, are sufficiently common, and well recognised after the injection of antitoxin, yet I have not previously noticed their occurrence during the first three days. On two occasions, however, where the rash was found at this early stage, it was indistinguishable from that due to scarlet fever, and thus caused temporary anxiety. In one case, which recovered, the scarlatiniform erythema was present on the chest and shoulders five hours after the injection. It did not produce any pyrexia, and there was no vomiting, nor change in the throat. Next day it was distinctly fading. In the other case, which terminated fatally, the scarlatiniform erythema was also limited to the trunk, and appeared on the 3rd day, with vomiting and pyrexia. Vomiting continued, and the rash became purpuric, death occurring apparently from toxæmia, with uræmia, due to the severity of the diphtheritic process.

Concerning the 18 instances where tracheotomy was necessary, the results are given in the accompanying table, but it should be mentioned that in 6 of the 8 fatal cases death occurred within a few hours after admission.

TRACHEOTOMY CASES.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Cases	Died	Mortality. per cent.	Cases	Died	Mortality per cent.	Cases	Died	Mortality per cent.
Under 1 year......	1	...	...	...	...	...	1	...	...
1 to 2 years ...	2	1	50	3	1	33·3	5	2	40
2 to 3 ,, ...	1	1	100	...	...	...	1	1	100
3 to 4 ,, ...	2	1	50	1	...	...	3	1	33·3
4 to 5 ,, ...	1	...	...	...	...	...	1	...	...
5 to 10 ,, ...	2	2	100	3	1	33·3	5	3	60
10 to 15 ,, ...	1	...	...	1	1	100	2	1	50
Total...	10	5	50	8	3	37·5	18	8	44·4

It is, of course, generally admitted that the probability of recovery from diphtheria depends upon the promptness with which the disease is terminated by the injection of antitoxin. This promptness is usually reckoned by the number of hours or days which have elapsed between the onset of the disease and the administration of the remedy, such a standard being alone obtainable as a rule to compare the results of different observers. Unfortunately it does not take cognisance of the great differences in rates of progress between mild and severe attacks. If this point alone were considered in the 126 cases occurring in 1899, one would infer that, *per se*, it is of no value, since 46 out of 98 recoveries, and 13 out of 28 deaths, or in each group almost exactly 50 per cent., received the antitoxin within three days of the onset of the disease. On the other hand, when considering the condition of the urine, I have already drawn attention to the differences in the effects of the toxæmia at the time of admission, as shown by the degree of nephritis, and the same differences are found in the degree of glandular infiltration. From these points it may be inferred that the rapidity of the diphtheritic processes, constituting the difference between a mild and a severe attack, is a most important factor in deciding the necessity for urgency in treatment; and one cannot help feeling that it is the absence of this discrimination as to the time which may be allowed to elapse before giving the antitoxin which is responsible for many of the deaths. Of course, laryngeal or intrapulmonary attacks have their own special dangers, but the advanced degree of toxæmia in the other fatal cases shows that either the disease is not diagnosed in its early stages or that the medical practitioner, after making the clinical diagnosis, has allowed too long an interval to elapse before demanding its removal to the hospital.

During 1898 the committee decided that all cases should be examined bacteriologically before leaving the hospital, in order to prevent, as far as possible, any cases from being discharged in an infectious condition. During the past year this examination has also been utilised for the cases of post-scarlatinal diphtheria. Unfortunately it would seem that this extra precaution is not efficacious in preventing the occurrence of infection, since three patients were allowed to leave the hospital, and subsequently cases of diphtheria arose in the houses to which they went. A fourth case is further interesting in that the throat, having been stated to be free from bacilli, the child was discharged, but a day or two later an otitis occurred, which it was presumed infected the person sleeping in the same room.

R. W. MARSDEN,
Medical Superintendent.

REPORT BY MR. A. T. ROOK, SUPERINTENDENT OF THE SANITARY DEPARTMENT.

Sanitary Department,
Town Hall, Manchester,

In presenting to the Medical Officer of Health the report of the work transacted in the Sanitary Department for the year ending 30th April, 1899, I beg to state that the City, for inspection and other purposes, is divided into 28 districts, to each of which one Sanitary Inspector has been assigned.

In addition to these, there is a Superintendent, two Chief Inspectors, three Drainage, four Smoke, one Canal Boats and Lodging-house, two Adulteration of Food, six Factory and Workshops Inspectors, and two Drain Examiners.

In the House Drainage Department there are also five Clerks of Works for supervising and measuring up work done by the contractors employed by the department in carrying out private drainage work.

The number of complaints of nuisances of various kinds made during the year was 36,691, viz.:—

4,756	through the Medical Officer of Health's Department
2,421	by the Public.
671	through the Police.
28,843	by the Staff.

The number of inspections and re-inspections was as follows*:—

47,781	Dwelling-houses.
1,667	Inspections and
5,046	Re-inspections of infected dwelling-houses.
1,078	Factories and Workshops.
33	Cellars.
910	Offensive trades.
51	Slaughter-houses.
564	Schools.
1,866	Mills.
292	Tips.
17,944	Miscellaneous.

In 4,064 houses and premises smoke or water tests have been applied to the drains for the purpose of discovering defects.

For the abatement of nuisances of various kinds, 12,372 notices were served, viz.:—

To abate overcrowding	146
To cleanse and limewash houses	669
To cleanse privies	63
To cleanse workshops	397
To discontinue nuisances arising from black smoke being emitted from chimneys	208
To repair, &c., house drains	2,748
To register houses occupied by lodgers	378
To remove offensive deposits, stagnant water, &c.	491
To abate nuisances arising from animals kept in a filthy state, or to remove such animals...	89
To repair, renew, or provide privies, ashpits, or water-closets...	1,190
To repair yards and passages	1,756
To repair dilapidated houses	2,669
To cleanse and disinfect dilapidated houses	1,197
To provide urinals to public and beer houses	54
To close houses in a dilapidated, &c., condition and consequently unfit for human habitation	37
To place bakehouses in a proper sanitary condition	16
To place workshops in a proper sanitary condition...	188
To provide satisfactory means of escape in case of fire at factories and workshops	66
To close workshops unfit for use on sanitary grounds	10

There have been 33,692 re-inspections made, after notices, to ascertain if the work had been done.

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* See also table for the year ending December 31st, 1899 (page 226), relating to nuisances.

HOUSES LET IN LODGINGS.

Under the powers given by section 90 of the Public Health Act, the byelaws made thereunder have been strictly enforced.

The number of houses on the register is 1,429.

To these, 1,018 day visits and 353 night visits have been paid.

Twenty-two infringements of the regulations have been reported and dealt with.

Two hundred and sixty-three night visits have also been paid to unregistered houses, the occupiers having previously denied that lodgers were kept.

DAIRIES, MILKSHOPS, AND COWSHEDS REGULATIONS.

Under this Order, which was made in July, 1879, 2,555 milkshops and dairies and 103 cowkeepers are now on the register. The number of cows kept is 1,375. The number of visits to dairies, milkshops, and cowsheds was 1,726.

It may be stated that many of the dairies and cowsheds are not in a very satisfactory condition, and great reluctance has been shown in the past, in consequence of the very serious structural alterations required, especially in cowsheds, to enforce the alterations necessary to bring them up to the present state of sanitary requirements. The new regulations, it is hoped, will enable the Inspectors to deal more effectually with insanitary cowsheds, &c., and already, under the advice of the Medical Officer of Health, five notices have been served.

WORKSHOPS, BAKEHOUSES, AND SHOP HOURS ACTS.

Shop Hours Act

During the year the Act has been fairly well observed, only a few persons having been reported for infringements.

Experience still further confirms the opinion expressed last year that in the absence of a declaration specifying the working hours for each day, as in the case of the Factory and Workshop Acts, it is difficult to produce sufficient evidence to justify prosecutions, the evidence of the young persons in nearly every instance, probably through the influence of their employers or other reasons, contradicting the signed declarations previously made to the Inspectors.

Workshop Acts

Great improvements have been effected since the last report in the condition of workshops, many alterations having been made—either after notice or at the request of the Inspectors—to improve the ventilation, lighting, overcrowding, cleansing, and general sanitary conditions.

Special attention has also been given to see that premises are provided with sufficient and satisfactory closet accommodation, this being a common defect in a number of the largest workshops.

In many of the cases reported the necessary accommodation has been provided, and others are under notice, and will be dealt with in due course.

Means of escape in case of fire

With regard to means of escape in case of fire, the whole of the factories and workshops in the city have been inspected, and as a result a large number were, in the opinion of the Inspectors, found to be unsatisfactory, and have been referred to the City Surveyor for his report thereon.

In several of the worst cases the necessary provision has been made; while the others, some of which are under notice, are receiving attention, and in another year it is hoped that every building in the city coming within the Act will in this respect be rendered perfectly safe.

Periodical changes will, of course, from time to time take place in various ways which will bring buildings within the meaning of the Act, and necessitate the constant supervision of the Inspectors, and action on the part of the authorities.

Bakehouses

During the year several more of the worst bakehouses in the city have been absolutely closed, and a number of others have been reported by the Medical Officer of Health to be unfit for use until satisfactory alterations are made to place the premises in a better sanitary condition.

Extensive alterations have been made in many of the bakehouses, and a general improvement is manifest throughout the city consequent upon the action taken by the department.

Out-workers

Many visits have been paid to houses in which out-work is carried on, but constant visitation is necessary to maintain the standard of cleanliness which is to be desired, especially in houses in which shirt-making, handkerchief-hemming, brace-making, and umbrella-covering, &c., is done. This class of work is almost exclusively confined to the poorer people, who live in small houses in the congested parts of the city.

The people, as a rule, appear willing to carry out any suggestion made by the Inspectors to keep their houses clean; but, at the same time, it is almost impossible for small houses, sometimes containing large families, to be kept in such a satisfactory condition as workshops.

The work done under the above Acts is shown in the following tables :—

Showing the Work done by the Inspectors under the Shop Hours and Factory and Workshops Acts, May 1st, 1898, to April 30th, 1899.

Number of District	INSPECTOR	SHOPS					WORKSHOPS						Number of visits to houses where outworkers are employed	Factories and Workshops not provided with proper means of escape in case of fire	BAKEHOUSES					
		Number of visits	Number of Infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits	Number in which Sanitary Defects were found	Number of Reports referred to Factory Inspector (unregistered factories, &c.)	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register			Number of visits	Number in which Sanitary defects were found (principally cleansing)	Number of reports referred to Factory Inspector	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register
1	Edward E. Roberts	135	11	8	4	578	2743	248	227	31	230	1010	...	8	389	31	9	8	8	72
2	John Kewley	232	7	3	8	845	3052	168	203	16	217	1139	7	6	792	88	12	2	21	168
3	Ernest Bailey	487	5	1	15	614	2560	91	174	8	168	1019	...	9	634	47	4	4	7	136
4	Francis J. Rowe	142	2	...	16	788	3244	115	200	...	205	1181	...	5	947	32	20	...	30	132
...	Emma Coppock	1376	2	1	105	...	1808	61	...	...	...	...	1009	...	...	...	...	...	...	...
...	Alice Tattersall	1605	20	15	164	...	1903	19	...	1	...	...	1606	...	...	...	...	...	...	...
...	Totals	3977	47	28	312	2825	15310	702	804	56	820	4349	2622	28	2762	198	45	14	66	508

Prosecutions for Offences, with Results.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid			Dismissed, Withdrawn, &c.
			£	s.	d.	£	s.	d.	
Piccadilly Restaurant Company Limited	135, Market Street..............	Employing a young person over 74 hours a week in contravention of the Shop Hours Act	0	5	0	0	5	0	......
Clement Hall Prosser	57, Shakespeare Street, C.-on-M.	Ditto ditto ...	0	2	6	0	2	6	......
Alice Yates	Wine Lodge, Palace Square	Ditto (four young persons)...	1	0	0	1	1	0	... ..
Edwin Pleasance ...	519, Cheetham Hill Road	Ditto (two ditto)...	0	10	0	0	10	0	......
William Black	48, John Dalton Street	Not exhibiting Abstract of Shop Hours Act in a conspicuous position in his shop	0	2	6	0	2	6	......
Walter Harrison ...	45, Grange Street, Rusholme...	Ditto ditto ...		......		0	3	0	Withdrawn
Edwin Pleasance ...	277, Waterloo Road	Ditto ditto ...	0	10	0	0	8	6	......
Ambrose Byrom ...	83, Bury New Road..............	Ditto ditto ...	1	0	0	0	8	6	......
Patrick Doherty ...	Shudehill Market.................	Ditto ditto ...	1	0	0	0	8	6	......
Thomas Gothard ...	166, Stretford Road, Hulme....	Ditto ditto ...		......		0	3	6	Withdrawn
William Griffin	32, Ditto ditto ...	Ditto ditto ...	0	5	0	0	5	0	......
Emanuel Hiscott ...	24, Ditto ditto ...	Ditto ditto ...	0	5	0	0	5	0	......
Mary Elizabeth Irlam	364, Ditto ditto ...	Ditto ditto ...	0	5	0	0	5	0	......
George William Millward	336, Stockport Road	Ditto ditto ...	0	5	0	0	5	0	......
Walter Walters	217, Deansgate	Ditto ditto ...	0	5	0	0	5	0	......
John Wm. Sherlock.	142, Wilmslow Road, Fallowfield	Ditto ditto ...	0	5	0	0	5	0	......
Harry Kerridge......	122, Medlock Street, Hulme ...	Ditto ditto ...	0	5	0	0	5	0	......
		Carried forward ......£	6	5	0	5	8	0	

Prosecutions for Offences, with Results—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid			Dismissed, withdrawn, &c.
			£	s.	d.	£	s.	d.	
		Brought forward.........	6	5	0	5	8	0	
Samuel Whittam ...	57, Higher Ormond Street......	Not exhibiting abstract of Shop Hours Act in a conspicuous position in his shop	0	5	0	0	5	0	......
Harry Strowger......	Smithfield Market	Ditto ditto ...	0	5	0	0	5	0	......
Ambrose and John Miller..............	Old Shambles, Victoria Market	Ditto ditto ...	0	5	0	0	5	0	......
Edward Morgan ...	75, London Road	Ditto ditto ...	......			......			Dismissed
Thomas Fredk. Dove	91, Ditto	Ditto ditto ...	0	2	6	0	2	6	......
Jas. Edward Whipp..	39, Stockport Road..............	Ditto ditto ...	0	2	6	0	2	6	......
Barnet Frank.........	126, Red Bank	Having his bakehouse in a dirty condition	0	10	0	0	8	6	......
Ditto	Ditto	Ditto ditto ...	0	10	0	0	8	6	......
Eli Morris	11, Lord Street, Red Bank......	Ditto ditto ...	1	0	0	0	8	6	......
Simon Rubenstein...	37, Bury New Road	Ditto ditto ...	1	0	0	0	8	6	......
Jacob Marcovitch...	3, Nightingale Street	Ditto ditto ...	0	10	6	0	8	6	......
James Taylor	19, South Porter Street	Ditto ditto ...	0	1	0	0	2	6	...
Samuel Simister.....	338, Stockport Road	Ditto ditto ...	0	5	0	0	5	0	......
Samuel Cohen	18, Fernie Street, Red Bank ...	Ditto ditto ...	0	5	0	0	5	0	......
Louis Cohen.........	21, Honey Street, Cheetham...	Ditto ditto ...	1	1	0	0	8	6	......
George Henry Morgan	263, Ashton Old Road, Ardwick	Ditto ditto ...	0	10	0	0	8	6	......
		Carried forward......£	12	17	6	10	0	0	

PROSECUTIONS FOR OFFENCES, WITH RESULTS—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid			Dismissed, withdrawn, &c.
			£	s.	d.	£	s.	d.	
		Brought forward	12	17	6	10	0	0	
Morris Megovski	5, Davison Street	Neglecting to abate overcrowding of his workshop after notice	......			0	7	6	Order of abatement made
West End Clothing Company Limited	1, Cromford Court, Market Street	Ditto ditto	......			0	7	6	Do.
Joseph Isaacs	26, Adeline Street, Cheetham	Ditto ditto	......			0	7	6	Do.
Morris Phillips	10, Park Street, Cheetham	Ditto ditto	......			0	7	6	Do.
Chas. Henry Foden.	1 and 2, Holden's Buildings, Back Redfern Street	Ditto ditto	......			0	7	6	Do.
Henry Isherwood	33, Bridge Street, City	Neglecting to limewash ceiling and walls of his workshop after notice	......			......			Withdrawn
Charles Scholes	24, Port Street, Piccadilly	Ditto ditto	0	10	0	0	8	6	......
Thomas Griffiths	9, Corporation Street	Ditto ditto	......			0	3	0	Withdrawn
Aaron Challoner	2 and 4, Back Pump Street	Ditto ditto	......			0	3	0	Do.
Hyman Marcus	46, Henry Street, Ancoats	Ditto ditto	......			0	3	0	Do.
William Payne	2, Back Fawcett Street	Ditto ditto	......			......			Do.
Abraham Wilks	4, Adeline Street	Ditto ditto	......			......			Do.
John Carter	61, Foundry Street, Oldham Road	Ditto ditto	......			0	3	0	Do.
James Baxter	138a, Rochdale Road	Ditto ditto	......			......			Do.
Riso Levi	45a, Market Street	Ditto ditto	......			......			Do.
Richard Alexander Lowe	6, Mayes Street, Dantzic Street	Ditto ditto	......			0	3	0	Do.
		Carried forward	13	7	6	13	1	0	

Prosecutions for Offences, with Results—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid			Dismissed, Withdrawn, &c.
			£	s.	d.	£	s.	d.	
		Brought forward......	13	7	6	13	1	0	
John William Hirst..	271a, Oldham Road	Neglecting to limewash ceiling and walls of his workshop after notice	......			......			Withdrawn
Thomas Cavanah ...	97a, Oxford Street, C.-on-M. ...	Ditto ditto ...	......			......			Do.
David Battersby ...	13, Port Street, Ancoats.........	Ditto ditto ..	......			......			Do.
Frederick Henshaw.	59a, Lever Street	Ditto ditto ...	......			0	3	0	Do.
John Hill	68, Spear Street, Ancoats	Ditto ditto ...	......			......			Do.
Sam Lewis...........	65, Market Street	Neglecting to ventilate his workshop after notice	......			......			Do.
Morris Freeman ...	1, 3, 5, Ashley Lane	Neglecting to place workshops and closets in a proper sanitary condition after notice	......			0	7	6	Order of abatement made
Paul Klainman	1, Derby Court, Long Millgate	Ditto ditto ...	......			0	7	6	Ditto
Morris Nathan	7, Ditto ditto	Ditto ditto ...	......			0	7	6	Ditto
Louis Goldman......	1, Ditto ditto	Ditto ditto ...	......			0	7	6	Ditto
Jacob Lazarus	10, Dttto ditto	Ditto ditto ...	......			0	7	6	Ditto
Jacob Fink	6, Ditto ditto	Ditto ditto ...	......			0	7	6	Ditto
John Rich	4, Ditto ditto	Ditto ditto ...	......			0	7	6	Ditto
David Nathan	7, Ditto ditto	Ditto ditto ...	......			0	7	6	Ditto
John Griffiths	13, Rosamond Street, Salford...	Ditto (workshop, 2/4, Back Pump Street)	......			......			Withdrawn
Messrs. Turner & Littler	49, King Street, City	Ditto (23, Downing Street)	......			......			Ditto
William H. Robinson	75, Bridge Street, City	Ditto (140/142, Princess Street)	......			......			Ditto
		Carried forward......£	13	7	6	16	4	0	

PROSECUTIONS AND OFFENCES WITH RESULTS—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid			Dismissed, Withdrawn, &c.
			£	s.	d.	£	s.	d.	
		Brought forward.........	13	7	6	16	4	0	
James William Barlow	6, Booth Street, Piccadilly	Neglecting to place workshops and closets in a proper sanitary condition after notice, 143, Princess Street		......			......		Withdrawn
John B. Midgley ...	1, Cooper Street	Ditto (3B, York Street, C.-on-M.)		......			......		Ditto
Samuel Walker	28, Bradford Street..............	Ditto (Woodward Place)		......			......		Ditto
William Royle	17, Cooper Street	Ditto (122, Great Ancoats Street)		......			......		Ditto
Richard Melling ...	Crowcroft Farm, Levenshulme	Ditto (5, Wilton Street)		......		0	3	0	Ditto
James Royle	Albert Square, City..............	Ditto (1, Britannia Street)		......		0	3	0	Ditto
Do.	Ditto	Ditto ditto ...		......		0	7	6	Order of abatement made
Thurston Dale Brownson	Mill Street, Red Bank	Neglecting to place workshops and closets in a proper sanitary condition after notice		......		0	7	6	Ditto
Richard Risk	Ditto	Ditto ditto ...		......		0	7	6	Ditto
Solomon Goldstein..	Skip Place, Cheetham...........	Ditto ditto ...	0	10	0	1	6	0	Ditto
Sam Marks	1c, Southall Street, Strangeways	Ditto ditto ...	0	5	0	0	12	6	Ditto
William Thomas Hailwood	6, Marcer Street, Holland Street	Ditto ditto ...		......		0	3	0	Withdrawn
Ann Hampson	13, Henry Street, Ancoats	Neglecting to discontinue the use of her workshop as a stable after notice		......		0	3	0	Ditto
		TOTAL...........£	14	2	6	19	17	0	

SMOKE NUISANCES.

For the abatement of smoke nuisances, the four Inspectors appointed specially for this work have taken 2,136 timed observations of half-an-hour each, with the result that 208 notices for the abatement of nuisances have been served. In addition to which, proceedings before the Magistrates have been ordered in 184 cases out of 267 offences reported. These cases were disposed of as follows :—

One hundred and sixty-one were summoned before the justices, in 110 of which fines were imposed amounting to £257 16s. 6d., and costs £64 2s.

One was ordered to pay costs only.

Forty-one orders of abatement were granted and served, and 8 cases were excused, dismissed, or withdrawn, and 1 case was adjourned.

Much attention during the past year, as will be seen by the above, has been given to the nuisance caused by the emission of black smoke, not only from the furnaces connected with boilers in mills, warehouses, and other works, but also from chemical and other industries, and the efforts made have already resulted in a considerable reduction of the nuisance. It is hoped that the proceedings now pending against certain grave offenders will have a further beneficial effect. It is much to be regretted that many of the Authorities bordering the City, especially on the North-east and West sides, take so little interest in the prevention of this kind of nuisance, from which Manchester citizens suffer so severely.

SALE OF FOOD AND DRUGS ACTS AND MARGARINE ACT.

Under these Acts, the two Inspectors specially appointed have purchased for analysis 1,737 samples. Of these, 66 only were adulterated, viz. :—

Butter	22
Milk	30
Spirits	7
Tea	7

Fifty-three summonses were issued. In 37 cases fines were imposed amounting in the aggregate to £111 7s. 6d., with costs £63 14s. 4d.

Three persons were ordered to pay costs only.

Thirteen summonses were dismissed or withdrawn.

Appended are tables showing the result of the action taken under the Acts since 1873.

Showing the number of Articles of Food and Drugs procured for Analysis, the number Adulterated, the number informally purchased or in which no proceedings were taken, and the number of cases in which Magisterial Proceedings were taken, together with the Decisions and the Total Amount of Fines imposed from May 1st, 1873, *to April* 30*th*, 1899.

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates.						
				No. Summoned	No. Fined	Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn	Total Amount of Fines Imposed £	s.	d.
Arrowroot	6	...	...	...	...	...	...	......		
Bacon	1	...	...	...	...	...	...	......		
Baking Powder	19	...	...	...	...	...	...	......		
Beef Dripping	1	...	...	...	...	...	...	......		
Beer	312	2	2	...	...	...	...	......		
Bread	954	39	7	32	32	...	...	119	10	0
Butter	1539	295	24	271	213	3	55	350	8	6
Buttermilk	2	2	2	...	...	...	...	......		
Cheese	84	4	2	2	2	...	...	3	10	0
Chicory	42	...	...	...	...	...	...	......		
Cider	1	...	...	...	...	...	...	......		
Cocoa	1	...	...	..	...	...	...	......		
Cod Liver Oil	6	...	...	...	...	...	...	......		
Coffee	434	37	1	36	35	...	1	56	5	6
Confectionery	231	2	...	2	2	...	...	10	0	0
Cream	1	...	...	...	...	...	...	......		
Drugs	270	10	9	1	1	...	...	0	5	0
Fish (tinned)	1	...	...	...	...	...	...	......		
Flour	45	...	...	...	...	...	...	......		
Fruit (tinned)	2	...	...	...	...	...	...	......		
Jams	154	1	...	1	1	...	...	1	0	0
Jelly	2	...	...	...	...	...	...	......		
Ketchup	1	...	...	...	...	...	...	......		
Lard	592	27	5	22	18	...	4	44	3	6
Meats (Tinned)..	6	...	..	...	...	...	...	......		
Milk	16745	1374	21	1353	929	...	424	2806	8	6
Milk (skimmed)	144	23	...	23	18	...	5	39	1	6
Milk (condensed)	6	...	...	...	...	...	...	......		
Mineral Waters, &c.	220	79	76	3	...	...	3	......		
Carried forward	21822	1895	149	1746	1251	3	492	3430	12	6

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates.						
				No. Summoned	No. Fined	Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn	Total amount of Fines Imposed		
								£	s.	d.
Brought forward	21822	1895	149	1746	1251	3	492	3430	12	6
Mustard..	250	43	6	37	32	..	5	18	9	0
Oatmeal..................	59	...	...	...	...	...	...	......		
Olive Oil	12	1	...	1	1	...	...	0	2	6
Pepper	423	5	...	5	4	...	1	1	7	6
Pickles	4	...	...	...	...	...	...	......		
Porter	4	...	...	...	...	...	...	......		
Rice, Tapioca, &c.......	84	...	...	...	...	...	...	......		
Spices	159	1	...	1	...	...	1	......		
Spirits	729	32	7	25	22	...	3	36	16	0
Sugar....................	54	...	...	...	...	...	...	......		
Tea	317	10	7	3	2	...	1	2	0	0
Treacle	7	...	...	...	...	...	...	......		
Tripe	1	...	...	...	...	...	...	......		
Vegetables (tinned) ...	8	2	2	...	...	...	...	......		
Vinegar..................	127	8	...	8	7	...	1	2	10	6
Wines	35	...	...	...	...	...	...	......		
Totals...........	24095	1997	171	1826	1319	3	504	3491	18	0

Other Offences against the Acts.

Offence	No. Summoned	No. Fined	No. Dismissed or Withdrawn	Total amount of Fines imposed		
				£	s.	d.
Refusing to serve Inspector with Samples of Food	17	17	...	62	12	6
Giving False Warranty	11	3	8	16	0	0
Totals.....................	28	20	8	£78	12	6

Total amount of Penalties for Adulteration...............	£3,491	18	0
Total amount of Penalties for Other Offences...........	78	12	6
	£3,570	10	6
Total amount of Penalties against Farmers	£1,735	11	0

Table showing the number of persons summoned more than once under the Adulteration of Food and Drugs and Margarine Acts from May 1*st*, 1873, *to April* 30*th*, 1899.

MILK DEALERS.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	In County (Salford)
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Milk.	0 5 0 *8 W*	Withdrawn *10 W*	1 0 0 *16 W*	......	......
2	Do.	10 0 0 *60 F*	10 0 0 *11½ F*	......	......	......
3	Do.	10 0 0 *66 F*	5 0 0 *64 F*	1 0 0 *9½ W*	5 0 0 (*Skimmed Milk*) *8 W*	10 0 0 2 0 0 1 0 0 5 0 0
4	Do.	0 10 0 *6½ W & 5 F*	2 0 0 *9 W*	......	......	......
5	Do.	3 0 0 (Refusing)	10 0 0 *9 W*	5 0 0 *56 F*	......	......
6	Do.	2 0 0 *11 W*	2 cases Withdrawn (Farmer fined) *20 F each*	2 0 0 *10 W & 17 F*	5 0 0 *44 F*	......
7	Do.	2 0 0 *5 W*	Withdrawn *11½ W*	6 0 0 *1½ W & 15 F*	10 0 0 *2 W & 33 F*	......
8	Do.	3 0 0 *10 W & 25 F*	1 0 0 *5 W*	......	......	......
9	Do.	1 1 0 *24 W*	1 1 0 *30 F*	......	......	......
10	Do.	2 0 0 (Refusing)	Withdrawn (Farmer fined) *8 F*	2 10 0 *12 W*	5 0 0 *8 W*	......
11	Do.	2 0 0 *10 W*	Withdrawn (Farmer fined) *7 W*	2 0 0 *5 W*	......	......
12	Do.	1 0 0 *40 F*	1 0 0 *7 W*	5 0 0 (Refusing)	......	......
13	Do.	1 1 0 *8½ W*	5 0 0 *14 W*	2 0 0 *12 W*	1 10 0 *8 W*	2 0 0 20 0 0
14	Do.	10 0 0 *20 W*	5 0 0 *13 W*	5 0 0 *10 W*	......	.....

The figures in *Italic* denote the percentage of water added and fat abstracted.

Farmers.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In County
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
				Heard same day								
15	Milk	4 0 0 *7 W*	10 0 0 *4½ W*	20 0 0 *10 W*	Dismissed *9½ W*	Dismissed *8 W*	...	...	...	...	...	15 0 0 (Strangeways)
		Heard same day		*Heard same day*								
16	Do.	5 0 0 *12 W*	Costs only *26 W*	Dismissed *4½ W*	Dismissed *6½ W*	3 0 0 *10½ W*	3 0 0 *11½ W*	...	...	...	...	...
17	Do.	10 0 0 *33 F*	2 cases 20 0 0 *28 F* *28 F*	...	...	...	...	...	...	...	...	...
18	Do.	15 0 0 (In 2 cases) *20 F* *20 F*	15 0 0 (In 3 cases) *4½ W* *5 W* *8 W*	...	...	...	...	...	...	...	Hanley, Staffs.	40 0 0 (In 4 cases)
19	Do.	2 cases Dismissed *4 W & 8 W*	Dismissed *10 W*	...	...	...	...	...	...	...	...	2 0 0 Gorton *8 W*
20	Do.	2 0 0 (In 3 cases) *6 W* *4 W* *10 W*	4 0 0 (In 2 cases) *8 F* *13 F*	...	...	...	...	...	...	...	...	...
21	Do.	5 0 0 *7½ W*	2 0 0 (In 2 cases) *28 F* *10 F*	...	...	...	...	...	...	...	...	...
22	Do.	10 0 0 (In 2 cases) *10 W* *4½ W*	1 0 0 (In 4 cases) *16 F* *45 F* *30 F* *31 F*	...	...	...	...	...	...	...	...	..
23	Do.	2 0 0 *8 W*	10 0 0 *10 W*	5 0 0 (Refusing)	...	...	..	...	...	...	...	...
24	Do.	2 0 0 *4½ W*	2 0 0 (In 2 cases) *9½ W* *6 W*	...	...	...	..	...	...	...	...	...
25	Do.	4 0 0 (In 2 cases) *28 F* *33 F*	10 0 0 (In 2 cases) *10 F* *10 W*	...	...	...	...	...	...	...	...	...

The figures in *Italic* denote the percentage of water added and fat abstracted.

FARMERS—*continued.*

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In County
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
26	Milk	15 0 0 *30 W*	20 0 0 *39 W*	10 0 0 (Refusing)	10 0 0 (Refusing)	10 0 0 *14 W*	5 0 0 (Refusing)	20 0 0 *14 W*	20 0 0 *12 W*	10 0 0 *15 W*	10 0 0 *8 W*	20 0 0 (Strangeways)
27	Do.	2 0 0 *12 F*	5 0 0 *4½ W* *15 F*	...	...	...	...	...	...	...	...	...
28	Do.	2 0 0 (In 2 cases) *20 W* *29 W*	2 0 0 *23 W*	...	...	...	...	...	...	...	...	...
29	Do.	4 0 0 (In 2 cases) *7 W* *10 W*	5 0 0 (In 2 cases) *8 W* *8 W*	...	...	...	...	...	...	...	...	...
30	Do.	5 0 0 *20 F*	5 0 0 *13 W*	...	...	...	...	...	...	...	...	...
31	Do.	1 0 0 *10 F*	5 0 0 *20 F*	10 0 0 *6 W*	2 cases 5 0 0 *10 W* *6 W*	5 0 0 *12 F*	2 0 0 *6 W*	...	...	...	...	...
32	Do.	3 0 0 *12½ W*	5 0 0 *8 W*	...	...	...	....	...	...	...	...	...
33	Do.	15 0 0 (In 3 cases) *7 W* *12 W* *11 W*	10 0 0 *20 W*	...	...	...	...	...	...	...	...	...
34	Do.	2 0 0 *10 F*	5 0 0 *11 W*	5 0 0 *11 W*	3 cases 20 0 0 *11 W* *15 W* *15 W*	...	...	...	...	...	Altr'ncham Salford Do.	Dismissed 2 0 0 2 0 0
35	Do.	*Heard same day* 15 0 0 *17 W*	5 0 0 *17 W*	...	...	...	...	...	...	...	Salford L'pool Do.	10 0 0 10 0 0 10 0 0
36	Do.	10 0 0 (In 2 cases) *44 F* *25 F*	5 0 0 *8½ W &* *7 F*	...	...	...	...	...	...	...	...	...
37	Do.	2 cases 5 0 0 5 0 0 *7 W* *10 W*	2 cases 10 0 0 10 0 0 *16 W* *13 W*	...	...	...	...	...	...	...	...	...
38	Do.	2 cases 1 0 0 1 0 0 *17 F* *20 F*	10 0 0 *7 W*	...	...	...	...	...	...	...	...	...

The figures in *Italic* denote the percentage of water added and fat abstracted.

BUTTER CASES.

No.	1st Offence	2nd Offence	3rd Offence	4th Offence
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
39	Costs only July 19th, 1878 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	Withdrawn Jan. 11th, 1893 (Excess Water) *10 per cent.*	Withdrawn Jan. 11th, 1893 (Excess Water) *8½ per cent.*
40	2 0 0 Jan. 13th, 1886 (Butterine)	1 0 0 Dec. 7th, 1887 (Butterine)	....	....
41	2 0 0 April 16th, 1884 (Butterine)	2 0 0 Jan. 15th, 1886 (Butterine)	Costs only Jan. 10th, 1894 (Packet not marked Margarine)	....
42	2 0 0 April 16th, 1884 (Butterine)	3 0 0 Dec. 22nd, 1886 (Butterine)	3 0 0 March 5th, 1890 (Margarine)	3 0 0 March 5th, 1890 (Margarine)
43	2 0 0 May 21st, 1884 (Butterine)	5 0 0 Jan. 13th, 1886 (Butterine)	5 0 0 Dec. 7th, 1887 (Butterine)	....
44	0 10 0 Dec. 7th, 1887 (Butterine)	Dismissed March 14th, 1894 (Excess Water) *6 per cent.*	Dismissed March 14th, 1894 (Excess Water) *5½ per cent.*	....
45	2 0 0 March 31st, 1886 (Butterine)	1 1 0 May 2nd, 1888 (Margarine)	....	....
46	Dismissed April 8th, 1885 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	....	....
47	Do.	Do.	....	....
48	2 0 0 April 16th, 1884 (Butterine)	10 0 0 Nov. 13th, 1889 (Margarine)	....	....
49	1 1 0 Dec. 7th, 1887 (Butterine)	2 0 0 April 17th, 1889 (Margarine)	....	....
50	5 0 0 March 21st, 1888 (Margarine)	Withdrawn Jan. 11th, 1893 (Excess water) *9 per cent.*	....	....
51	0 5 0 March 13th, 1889 (Margarine)	Dismissed Jan. 23rd, 1894 (Excess Water) *11½ per cent.*	....	....
52	0 5 0 Oct. 3rd, 1888 (Margarine)	Dismissed March 14th, 1894 (Excess Water) *7 per cent.*	....	....

The figures in *Italic* denote the percentage of water added and fat abstracted.

CANAL BOATS ACTS.

The number of canal boats on the register is 436.

The number inspected was 2,111, resulting in six infringements of the Act being discovered, which were referred to the Justices to be dealt with; in five cases fines were imposed amounting in the aggregate to £1 12s. 6d., and the costs £1 7s. 6d., and one case was withdrawn.

Ninety-five caution notices were sent to the owners and masters.

OFFENSIVE TRADES.

The number of offensive trades on the register is 684. These have been placed under close supervision, and periodical visits paid.

UNHEALTHY DWELLINGS.

During the year, 635 houses were certified to be dealt with by the Sanitary Committee.

Of these, 480 were ordered to be closed.

A large proportion of these houses have since had structural alterations made to them which satisfied the requirements of the Medical Officer of Health, and have since been allowed to be reinhabited.

CLOSET ACCOMMODATION TO WORKSHOPS, WAREHOUSES, &c.

Sixty-seven properties were reported as being deficient in closet accommodation, and 79 public and beer houses as being without or having unsatisfactory urinal accommodation.

In a large number of cases the necessary accommodation has been provided, and in others orders have been made to provide the necessary accommodation, or the reports are under consideration.

DRAINAGE WORK DONE BY THE HOUSE DRAINAGE DEPARTMENT.

During the year 510 cases of non-compliance with Notices have been referred by the District Sanitary Inspectors to the House Drainage Department to carry out the necessary work; 145 requests have been received from owners without notice having been served, and 417 orders from other Departments of the Corporation to execute work.

The whole of these included 4,883 private houses and 531 business premises.

The cost of the work executed amounted to the sum of £26,239 2s. 7d., which was apportioned as follows:—£19,419 10s. 3d. to the Owners, and £6,816 12s. 4d. to the Highways and City Fund Account.

PARTICULARS RELATING TO THE OPERATIONS OF THE CLEANSING COMMITTEE.

Cleansing Department,
Town Hall, Manchester,
August 13th, 1900.

Dear Sir,—I have pleasure in giving you the following information:—There are within the City, pail-closets, 75,740; ash-boxes, 59,815; midden privies, 22,680; wet middens, 11,866; dry middens, 743; water-closets, 39,321; and cesspools, 90. The pail-closets are systematically emptied at regular intervals—once, twice, or thrice weekly, as necessity demands. The midden-privies are emptied as required. The contents of the pail-closets are taken to Holt Town and Water Street. At Holt Town the fæcal matter is dried into concentrated manure. The dry refuse is consumed in the Galloway boilers, and generates the steam required for working the machinery. The worthless fine ash, which cannot be consumed, is deposited at the nearest tip at Clayton Bridge. The privy refuse and fæcal matter which is taken to Water Street is sent away in its crude state as night-soil to Carrington and Chat Moss Estates and to farmers in Cheshire. Dry combustible matter is passed into the destructor furnaces or under the Galloway boilers at Water Street, and there destroyed. A large quantity of fine ash at Water Street is used as an absorbent for the fæcal matter from the pail-closets.

The market garbage, of which we have 5,289 tons per annum, is carted to Water Street, and there loaded into boats and sent away to farmers and Carrington and Chat Moss Estates immediately. Slaughter-house refuse is collected from the abattoirs and private slaughter-houses and sent to Holt Town, where it is passed through dryers, and evaporated to dryness; the dry material is then added to our concentrated manure. Street sweepings are generally deposited at the nearest depot, and after being allowed to drain are carted to the nearest tip.

The total quantity of material collected by this Department during the past year amounted to 376,461 tons.

We have within the City about 60 destructor furnaces of different kinds, and last year 14,528 tons of mortar was made from the clinker which is obtained from such furnaces.

We employ nearly 100 "orderly" boys, who collect horse-droppings and litter from the street, and deposit the same in the bins which are fixed in the footpaths. The contents of the bins are removed twice daily, and taken to the nearest depot.

With regard to the removal of the contents of the pails from Typhoid Fever cases: Acting upon instructions we received from you, special pails and lids are supplied for all cases of Enteric Fever; labels are attached to the pails, asking the occupants to use disinfectants, which are supplied with the pails; the pails are left in the yard, and not placed in the ashplace. The occupants of the houses are requested to use this special pail for the reception of the fæcal matter and washings from the patient only. The pails are removed periodically in a specially constructed vehicle, and taken to Holt Town depot, where the contents are destroyed.

With regard to the cleansing of passages, we have a staff of about 40 men engaged specially upon this work. They regularly, at least once a week, cleanse the back passages in certain districts, and during last year 296,225 swillings and cleansings were effected in courts and passages.

During the year 73,655 barrels of water were used in degging the streets, and 260,187 grids were unstopped.

During the past nine years we have deposited upon the various tips within the City the following quantities of material, viz.:—In 1892, 99,866 tons; 1893, 109,078 tons; 1894, 103,949 tons; 1895, 113,836 tons; 1896, 107,883 tons; 1897, 99,658 tons; 1898, 96,635 tons; 1899, 104,481 tons; and in 1900, 95,138 tons. The bulk of this material was deposited on the tips at Clayton and Harpurhey. It is composed principally of dry ashes, street sweepings, and bell-dust. Occasionally the contents of dry middens are sent there. During last year 25,406 tons of material was sent to Carrington Estate and 62,584 to Chat Moss Estate.

Yours faithfully,
G. PLANT,
Superintendent.

Dr. Niven,
Medical Officer of Health,
Town Hall, Manchester.

REPORT WITH REFERENCE TO UNWHOLESOME MEAT, FISH, &c.

City Abattoirs,

January 8th, 1900.

To Dr. Niven, Medical Officer of Health,
Town Hall.

Sir,—I herewith submit the following report with reference to unwholesome meat, fish, &c., condemned and destroyed in this City under the Public Health Act of 1875, during the year ending December 31st, 1899 :—

Meat and Fish.

Beef	130,144 lbs.
Mutton	13,442 ,,
Veal	3,901 ,,
Pork	30,337 ,,
Total	177,824 lbs.

Fish	121,677 lbs.
Shellfish	26,319 ,,
Total	147,996 lbs.

Venison	251 lbs.
Rabbits	7,076 head

Game.

Hares	121 head
Partridge	8 ,,
Grouse	32 ,,
Ptarmigan	1,943 ,,
Pheasants	1 ,,
Rooks	168 ,,
Quails	96 ,,
Wood Pigeons	2 ,,
Plovers	1 ,,

Poultry.

Turkeys	22 head
Geese	122 ,,
Ducks	634 ,,
Chickens	1,999 ,,
Pigeons	89 ,,

Miscellaneous.

Fruit.

Bananas	1 crate
Lemons	4 cases
Pears	14 barrels
Apples	24 ,,
Plums	29 baskets
Cherries	34 ,,
Blackberries	43 ,,
Black Currants	200 ,,
Strawberries	103 ,,
Raspberries	7 ,,

Vegetables.

Parsnips	15 bags
Chumps	11 ,,
Cauliflowers	2 crates
Cress	13 ,,
Celery	1 bundle

Eggs	4 boxes

With the exception of 11,972 lbs. of meat, 709 lbs. of fish, 35 rabbits, and 37 head of poultry, which were seized while deposited or exposed for the purpose of sale, the above amounts were surrendered by the trade after being condemned by the inspectors.

The number of carcases, portions of carcases, consignments of fish, etc., condemned during the year has been 1,790, from the following causes :—

Decomposing	1,098
Tuberculosis	241
Unmarketable	132
Smothered	64
Injured	41
Swine Fever	40
Inflammation	32
Emaciation	30
Abscesses	19
Dropsy	15
Pleurisy	10
Fevered	7
Parturient Fever	7
Hydatid Disease	7
Peritonitis	5
Black quarter	5
Unclean	5
Actinomycosis	3
Apoplexy. .	3
Joint disease	3
Liver Rot	3
Pericarditis	3
Drowned	2
Metritis	2
Tar tainted	2
Unseasonable	2
Nephritis	2
Choked	1
Septicæmia	1
Rheumatism	1
Mammitis	1
Diarrhœa	1
Tumours	1
Asphyxia	1

Of the meat, fish, etc., there was condemned :—

In the Abattoirs and Carcase Markets (90,509 lbs. of which was dressed meat consigned from places other than the City).	129,398	lbs.
,, Pig Market	9,420	,,
,, Private Slaughter-houses	9,921	,,
,, Private Piggeries	4,053	,,
,, Railway Stations	5,014	,,
,, Shops (12,520 lbs. of which was offal imported from Denmark.)	16,148	,,
,, Carts in Streets	50	,,
,, Cold Air Stores	6,414	,,
,, Rusholme Abattoirs	230	,,
,, Triperies	1,159	,,
,, Private Stores	4,390	,,
,, Fish Market	139,874	,,

The game, poultry, and rabbits were condemned principally in the Wholesale and Retail Fish and Poultry Markets and the Cold Air Stores; the fruit and vegetables in the Smithfield Market and on hawkers' carts.

Twelve orders for the destruction of unsound food have been obtained at the City Police Courts during the year.

There have been three prosecutions under Section 116 of the Public Health Act, 1875, and in each instance a fine has been imposed, amounting in the aggregate to £27 and costs.

In addition to the inspection at the Abattoirs and Markets, 3,402 visits have been made to the private slaughter-houses (250 being at the request of the butchers), and 9,044 carcases examined; 14 carcases, and portions of 45 others, being condemned as unfit for human food.

Eleven seizures of unwholesome food have been made in shops in the poorer districts of the City—four being on Sundays.

Diseases of Animals.

There have been no outbreaks of contagious diseases during the year, and, owing to the decrease of swine fever, the Board of Agriculture have withdrawn the Swine Fever (Movement) Order of 1898 from this district.

Examinations have been made periodically of all cows in the cowsheds of the City, attention being paid to the health of the cattle and the condition of their udders. 20 cows were found to have some induration of the udder, and were reported to the Medical Officer of Health.

ALFRED HOLBURN, M.R.C.V.S.,
Chief Inspector.

TABLES

TABLE A.—MANCHESTER, 1899.

CAUSES OF DEATH AT DIFFERENT LIFE PERIODS IN THE 52 WEEKS OF THE YEAR.

PERSONS.—(MALES AND FEMALES.)

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
All Causes	13046	3610	2005	309	165	247	290	766	1140	1309	1413	1163	563	66
I. ZYMOTIC DISEASES......	2,606	1139	960	83	15	23	39	59	60	81	63	54	28	2
II. PARASITIC DISEASES ...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
III. DIETETIC DISEASES ...	82	...	...	...	...	...	...	8	23	24	21	6	...	...
IV. CONSTITUTIONAL DIS:.	2,186	192	222	68	68	95	122	314	387	328	253	110	24	3
V. DEVELOPMENTAL DIS:.	686	454	6	...	1	...	...	...	...	...	7	84	110	24
VI. LOCAL DISEASES	6,110	1022	706	130	70	112	112	344	600	807	990	823	361	33
VII. VIOLENCE	427	99	43	25	10	16	15	36	44	43	40	42	12	2
VIII. ILL-DEFINED CAUSES ...	949	704	68	3	1	1	2	5	26	26	39	44	28	2
I.—Zymotic Diseases.														
1. MIASMATIC DISEASES.														
Smallpox.. Vaccinated	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smallpox.. Unvaccinated	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smallpox.. No Statement......	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chickenpox	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Measles	699	155	507	33	1	...	2	1	...	...	...	...	...	...
Epidemic Rose Rash	2	...	2	...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever..	46	1	31	9	3	1	...	1	...	...	...	...	...	...
Typhus	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza	219	5	4	4	3	8	7	18	36	47	40	35	11	1
Whooping Cough	227	85	137	5	...	...	...	...	...	...	...	...	...	...
Mumps	2	1	1	...	...	...	...	...	...	...	...	...	...	...
Diphtheria	71	3	44	19	2	...	1	...	1	1	...	...	...	...
Membranous Croup	14	1	12	1	...	...	...	...	...	...	...	...	...	...
Cerebro-spinal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple and Ill-defined Fever ...	7	...	2	...	...	1	...	1	...	2	...	1	...	...
Enteric Fever	73	...	3	6	2	10	17	17	9	6	2	1	...	...
Other Miasmatic Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2. DIARRHŒAL DISEASES.														
Simple Cholera	18	9	2	...	...	...	1	1	...	3	2	...	...	...
Diarrhœa, Dysentery	1103	831	210	6	1	1	2	...	5	7	13	13	13	1
3. MALARIAL DISEASES.														
Remittent Fever	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Ague	2	...	...	...	...	...	...	...	...	...	2	...	...	...
4. ZOOGENOUS DISEASES.														
Hydrophobia	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glanders.............................	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Splenic Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cowpox and other effects of Vac:	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5. VENEREAL DISEASES.														
Syphilis	46	39	3	...	...	1	...	1	...	...	2	...	...	...
Gonorrhœa, Stricture of Urethra	10	...	...	...	...	...	...	1	1	6	...	1	1	...
6. SEPTIC DISEASES.														
Phagedæna	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Erysipelas	27	6	1	...	2	...	1	1	2	7	2	3	2	...
Pyæmia, Septicæmia	11	1	1	...	1	...	2	2	2	1	...	...	1	...
Puerperal Fever	24	...	...	...	...	1	5	14	4	...	...	...	...	...
II.—Parasitic Diseases.														
Thrush	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis : from Veg : Parasites	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydatid Disease	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: from Animal Par :...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE A, 1899—*continued.*

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
III.—Dietetic Diseases.														
Starvation, Want of Breast Milk	2	...	...	...	...	...	...	1	1	...	...	...	...	...
Scurvy	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intem: Chronic Alcoholism	72	...	...	...	...	...	...	5	18	24	19	6	...	...
Intem: Delirium Tremens	8	...	...	...	...	...	...	2	4	...	2	...	...	...
IV.—Constitutional Diseases.														
Rheum: Fev: Rheum: of Heart	38	...	...	5	6	2	3	13	5	3	1	...	...	...
Rheumatism	40	...	1	5	1	3	1	2	6	6	5	7	2	1
Gout	3	...	...	...	...	...	...	...	2	1	...	...	...	...
Rickets	41	12	27	1	1	...	...	...	...	...	...	...	...	...
Cancer	408	...	...	...	2	...	5	16	52	123	130	66	13	1
Tabes Mesenterica	129	72	51	3	2	1	...	...	...	...	...	...	...	...
Tuberc: Mening: (Hydroceph:)	151	49	62	19	12	3	2	3	...	1	...	...	...	...
Phthisis	1,117	7	24	15	24	77	101	256	303	178	96	30	6	...
Other forms of Tuberc: Scrofula	183	49	52	18	15	7	3	15	15	4	3	...	1	1
Purpura, Hæmorrhagic Diathesis	4	1	...	...	1	...	1	...	...	1	...	...	...	...
Anæmia, Chlorosis, Leucocy:	38	2	5	2	2	1	5	4	2	6	5	4	...	...
Diabetes Mellitus	34	...	...	...	2	1	1	5	2	5	13	3	2	...
Other Constitutional Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
V.—Developmental Diseases.														
[illegible]emature Birth	377	377	...	...	...	...	...	...	...	...	...	...	...	...
[illegible]electasis	13	13	...	...	...	...	...	...	...	...	...	...	...	...
Cyanosis	32	28	3	...	1	...	...	...	...	...	...	...	...	...
Spina Bifida	11	11	...	...	...	...	...	...	...	...	...	...	...	...
Imperforate Anus	3	2	1	...	...	...	...	...	...	...	...	...	...	...
Cleft Palate Harelip	4	3	1	...	...	...	...	...	...	...	...	...	...	...
Other Congenital Defects	21	20	1	...	...	...	...	...	...	...	...	...	...	...
Old Age	225	...	...	...	...	...	...	...	...	...	7	84	110	24
VI.—Local Diseases.														
1.–NERVOUS SYSTEM (DIS: OF).														
Inflam: of Brain or its Mem:	166	48	61	21	10	3	4	4	4	7	2	2	...	...
Apoplexy	285	2	...	...	1	...	4	6	25	55	83	85	22	2
Softening of the Brain	29	...	...	...	...	...	...	1	2	5	8	10	3	...
Hemiplegia, Brain Paralysis	93	1	1	1	...	...	...	2	6	7	27	30	17	1
Paralysis Agitans	5	...	...	...	...	...	...	...	...	1	3	...	1	...
Insanity, Gen: Par: of Insane	166	...	...	...	...	4	1	14	34	29	34	33	16	1
Chorea	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Epilepsy	37	...	1	3	1	4	3	2	8	5	5	3	2	...
Convulsions	193	151	39	...	...	...	1	1	...	1	...	...	...	..
Laryngismus Stridulus	16	9	6	1	...	...	...	...	...	...	...	...	...	..
Idiopathic Tetanus	1	...	...	1	...	...	...	...	...	...	...	...	...	..
Paraplegia, Dis: of Spinal Cord	50	1	3	...	2	3	...	4	4	9	12	9	2	1
Other Diseases of Nervous Sys:	59	8	6	4	2	2	...	2	15	9	6	1	4	..
2. ORGANS OF SPECIAL SENSE (DISEASES OF).														
Otitis, Otorrhœa	15	2	2	3	2	3	1	1	...	1	...	...	...	..
Epistaxis and Disease of Nose	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Ophthalmia and Disease of Eye.	2	...	1	...	...	...	...	...	...	...	...	1	...	...
3. CIRCULATORY SYS: (DIS: OF)														
Endocarditis	34	...	3	1	1	6	1	7	1	5	2	5	2	...
Valvular Disease	195	...	...	2	6	6	6	12	44	34	40	33	11	1
Pericarditis	16	1	1	1	1	1	2	...	2	4	3	...	...	...
Hypertrophy of Heart	6	...	...	...	...	1	...	...	2	1	1	...	1	..
Angina Pectoris	12	...	...	...	...	1	...	1	2	6	1	...	1	.
Syncope	127	5	1	...	...	...	...	3	10	14	21	38	30	5

TABLE A, 1899—*continued.*

CAUSES OF DEATH	All Ages	AGES AT DEATH Under 5 Years 0 to 1	 1 to 5	 5 to 10	 10 to 15	 15 to 20	 20 to 25	 25 to 35	 35 to 45	 45 to 55	 55 to 65	 65 to 75	 75 to 85	 85 and upwards
3. CIRCULATORY SYS: (DIS: OF) *(continued)*														
Aneurism	15	...	...	...	...	...	...	1	3	4	7	...	...	...
Senile Gangrene	21	...	...	...	...	...	...	...	...	...	6	8	7	...
Embolism, Thrombosis	22	...	...	1	1	...	1	7	4	4	2	1	1	...
Phlebitis	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Varicose Veins	2	...	...	...	...	...	...	...	...	1	1	...	...	...
Other Dis: of Circulatory Sys:	639	3	2	9	7	12	12	41	70	130	162	142	46	3
4. RESPIRATORY SYS: (DIS: OF)														
Laryngitis	28	5	15	1	...	...	...	1	2	4	...	...	...	...
Croup	12	3	9	...	...	...	...	...	...	...	...	...	...	...
Other Dis: of Larynx and Trachea	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Emphysema, Asthma	18	...	...	...	...	...	...	1	1	4	7	5	...	...
Bronchitis	1,290	313	121	12	3	1	2	22	62	144	247	227	124	12
Pneumonia	1,536	270	340	42	20	38	48	125	183	167	176	93	29	5
Pleurisy	40	...	3	1	1	...	2	7	5	13	6	1	1	...
Other Dis: of Resp: System	64	15	8	...	...	1	1	5	3	9	8	7	7	...
5. DIGESTIVE SYS: (DIS: OF).														
Stomatitis	14	11	3	...	...	...	...	...	...	...	...	...	...	...
Dentition	58	34	24	...	...	...	...	...	...	...	...	...	...	...
Sore-throat, Quinsy	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dyspepsia	13	3	...	...	...	...	...	...	1	...	2	4	3	...
Hæmatemesis	1	...	...	...	...	...	...	...	...	...	...	...	1	...
Melæna	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of Stomach	81	25	12	1	2	3	3	8	6	9	7	4	1	...
Enteritis	109	67	19	3	1	1	1	2	...	1	6	4	4	...
Ulceration of Intestine	2	...	...	...	...	1	...	...	1	...	...	...	...	...
Ileus, Obstruction of Intestine	32	3	1	2	...	1	...	3	4	8	5	4	1	...
Strict: or Strang: of Intestine	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Intussusception of Intestine	6	4	2	...	...	...	...	...	...	...	...	...	...	...
Hernia	23	2	...	...	...	...	...	2	...	5	6	6	2	...
Fistula	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peritonitis	52	2	3	10	3	8	4	9	4	4	3	1	1	...
Ascites	2	...	...	...	...	...	...	...	...	1	...	1	...	...
Gallstones	3	...	...	...	...	...	...	...	1	...	2	...	...	...
Cirrhosis of Liver	84	...	1	...	...	...	...	3	23	31	19	6	1	...
Other Diseases of Liver	42	12	...	2	...	...	2	3	4	4	6	8	1	...
Other Dis: of Digestive System	20	7	2	2	...	...	2	1	1	...	1	4	...	...
6. LYMPH: SYS: AND DUCTLESS GLANDS (DIS: OF).														
Diseases of Lymphatic System.	5	...	1	...	1	...	2	...	...	1	...	...	...	...
Diseases of Spleen	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchocele	4	...	...	...	...	...	1	1	1	...	1	...	...	...
Addison's Disease	2	...	...	...	...	...	...	...	...	...	2	...	...	...
7. URINARY SYSTEM (DIS: OF).														
Acute Nephritis	58	5	7	4	4	...	1	11	4	12	6	4	...	...
Bright's Disease	150	...	...	1	...	2	3	10	32	41	38	18	5	...
Uræmia	3	...	...	...	...	1	...	...	2	...	...	...	...	...
Suppression of Urine	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Calculus	6	...	...	...	...	...	...	1	1	1	2	...	1	...
Hæmaturia	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Dis: of Bladder and Prostate	31	...	...	...	...	...	1	...	2	4	5	10	8	1
Other Dis: of Urinary System	10	1	...	1	...	...	...	...	1	1	1	4	...	1
8. REPRODUCTIVE SYSTEM (DISEASES OF). *(a)* Generative Organs (Dis: of):														
Ovarian Disease	9	...	...	...	...	2	...	2	1	1	2	...	1	...
Diseases of Uterus and Vagina.	7	...	...	...	...	...	...	2	1	1	...	3	...	...
Disorders of Menstruation	1	...	...	...	...	...	...	...	1	...	...	...	...	...

TABLE A, 1899—*concluded.*

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
8. REPRODUCTIVE SYSTEM (DIS: OF)—*continued.*														
Pelvic Abscess	5	...	...	...	...	1	...	...	4	...	...	...	...	...
Perineal Abscess	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dis: of Testes, Penis, Scrotum, &c.	3	...	1	...	...	...	...	1	1	...	...	...	...	...
(b) Parturition, Disease of:														
Abortion, Miscarriage	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Puerperal Mania	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Convulsions	2	...	...	...	...	...	...	1	1	...	...	...	...	...
Placenta Prævia, Flooding	8	...	...	...	...	...	...	1	5	2	...	...	...	...
Phlegmasia Dolens	2	...	...	...	...	...	...	1	...	1	...	...	...	...
Other Accidents of Childbirth	14	...	...	...	...	1	...	9	4	...	...	...	...	...
9. LOCOMOTOR SYS: (DIS: OF).														
Caries, Necrosis	8	...	2	...	...	1	2	1	1	1	...	...	...	...
Arthritis, Ostitis, Periostitis	4	...	...	...	...	...	...	...	...	...	1	2	1	...
Other Dis: of Locom: Sys:	8	...	1	...	1	3	...	1	...	...	1	1	...	...
10. INTEGUMENTARY SYSTEM (DISEASES OF).														
Carbuncle	3	...	...	...	...	...	...	...	...	1	1	1	...	...
Phlegmon, Cellulitis	13	4	1	...	...	...	...	...	1	3	2	1	1	...
Lupus	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Ulcer, Bedsore	4	...	...	...	...	...	...	...	...	...	...	2	2	...
Eczema	3	2	1	...	...	...	...	...	...	...	...	...	...	...
Pemphigus	4	2	2	...	...	...	...	...	...	...	...	...	...	...
Other Dis: of Integ: Sys:	1	1	...	...	...	...	...	...	...	...	...	...	...	...
VII.—Violence.														
1. ACCIDENT OR NEGLIGENCE.														
Fractures, Contusions	155	3	10	3	5	8	8	14	20	26	17	28	12	1
Gunshot Wounds	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cut, Stab	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Burn, Scald	67	4	27	13	3	2	...	5	4	3	4	1	...	1
Poison	12	...	2	...	...	1	...	1	2	2	3	1	...	...
Drowning	38	1	2	9	1	2	2	4	5	5	4	3	...	...
Suffocation	101	91	2	...	...	1	3	1	2	...	...	1	...	...
Otherwise	5	...	...	...	...	1	...	...	...	1	2	1	...	...
2. HOMICIDE.														
Murder, Manslaughter	3	...	...	...	1	...	...	1	...	1	...	...	...	...
3. SUICIDE.														
Gunshot Wounds	2	...	...	...	...	...	...	1	1	...	...	...	...	...
Cut, Stab	4	...	...	...	...	...	...	...	1	1	2	...	...	...
Poison	18	...	...	...	...	1	1	4	5	1	5	1	...	...
Drowning	6	...	...	...	...	...	1	2	1	...	...	2	...	...
Hanging	11	...	...	...	...	...	...	1	2	1	3	4	...	...
Otherwise	4	...	...	...	...	...	...	2	1	1	...	...	...	...
4. EXECUTION:—Hanging.	...	...	...	...	...	...	...	...	...	...	...	...	...	...
VIII.—Ill-defined and not Specified Causes.														
Dropsy	2	1	...	...	...	...	...	...	1	...	...	...	...	...
Debility, Atrophy, Inanition	697	611	40	...	...	...	...	...	...	1	5	21	17	2
Mortification	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Tumour	9	...	2	...	1	...	...	2	1	1	1	1	...	...
Abscess	6	3	...	...	...	...	...	...	...	...	1	1	1	...
Hæmorrhage	4	3	...	...	...	...	...	...	1	...	...	...	...	...
Sudden (cause unascertained)	129	49	17	2	...	1	...	2	13	14	17	10	4	...
Other Ill-def: not spec: causes.	101	37	9	1	...	...	2	1	10	9	15	11	6	...

TABLE B.

1899.—Summary of Table A, compared with Average Deaths in Groups of Diseases, 1891–98.

	Deaths	
	1899	Average 1891-98
I.—Specific Febrile, or Zymotic Diseases:		
1. Miasmatic Diseases	1,363	1,212
2. Diarrhœal ,,	1,121	714
3. Malarial ,,	3	...
4. Zoogenous ,,	...	1
5. Venereal ,,	56	70
6. Septic ,,	63	81
II.—Parasitic Diseases	...	7
III.—Dietetic Diseases	82	62
IV.—Constitutional Diseases	2,186	2,085
V.—Developmental Diseases	686	635
VI.—Local Diseases:		
1. Diseases of Nervous System	1,101	1,212
2. Diseases of Organs of Special Sense	17	19
3. Diseases of Circulatory System	1,090	933
4. Diseases of Respiratory System	2,988	2,740
5. Diseases of Digestive System	543	554
6. Diseases of Lymphatic System and Ductless Glands	11	12
7. Diseases of Urinary System	259	269
8. Diseases of Reproductive System:		
(a) Diseases of Generative Organs	25	28
(b) Diseases of Parturition	27	46
9. Diseases of Locomotor System	20	35
10. Diseases of Integumentary System	29	24
VII.—Violence:		
1 Accident or Negligence	379	342
2. Homicide	3	7
3. Suicide	45	42
4. Execution:—Hanging	...	...
VIII.—Ill-defined and not Specified Causes	949	904
Total	13,046	12,035

TABLE C.—MANCHESTER, 1899.

CAUSES OF DEATHS AT DIFFERENT LIFE PERIODS—MALES.

Classes	CAUSES OF DEATH	All Ages Total	Ages at Death—in years												
			Under 5 Years												
			0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	6684	1895	992	149	82	130	166	387	633	725	725	540	235	25
I.	Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Measles	343	86	242	15	...	...	...	...	...	...	...	...	...	...
	Scarlet Fever	28	1	19	5	2	...	...	1	...	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	100	37	59	4	...	...	...	...	...	...	...	...	...	...
	Diphtheria	30	1	19	7	2	...	...	...	1	...	...	...	...	...
	Membranous Croup	7	1	5	1	...	...	...	...	...	...	...	...	...	...
	Ill-defined Fever	1	...	...	...	...	...	...	...	...	1	...	...	...	...
	Enteric Fever	43	...	1	1	1	8	15	8	5	3	1	...	...	...
	Influenza	100	2	1	4	2	5	4	9	22	20	15	11	5	...
	Simple Cholera	12	6	2	...	...	...	1	1	...	2	...	...	...	...
	Diarrhœa, Dysentery	535	407	98	3	...	1	...	...	2	4	6	9	4	1
	Venereal Affections	34	19	3	...	...	...	...	2	1	6	1	1	1	...
	Erysipelas	12	5	...	...	1	...	1	...	...	3	1	1	...	...
	Pyæmia	5	1	1	...	...	...	...	1	...	1	...	...	1	...
	Puerperal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Other Zymotics	7	3	1	...	...	...	1	...	...	...	2	...	...	...
II.	Parasitic Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
III.	Dietetic Diseases, Intemperance	57	...	...	...	...	...	...	6	17	18	15	1	...	...
IV.	Rheumatic Fever	13	...	...	2	1	...	2	4	3	...	1	...	...	...
	Rickets	19	6	12	...	1	...	...	...	...	...	...	...	...	...
	Cancer	144	...	...	...	..	...	3	4	17	45	46	24	5	...
	Tabes Mesenterica	64	39	21	2	1	1	...	...	...	...	...	...	...	...
	Hydrocephalus	85	29	33	12	8	2	1	...	...	...	...	...	...	...
	Phthisis	673	4	13	3	9	41	58	137	186	120	73	23	6	...
	Scrofula, Tuberculosis	111	30	30	11	11	4	2	7	11	2	2	...	...	1
	Constitutional Diseases (other)	56	1	4	4	2	3	2	3	7	9	11	9	1	...
V.	Premature Birth	202	202	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other)	40	37	2	...	1	...	...	...	...	...	...	...	...	...
	Old Age	88	...	...	...	...	...	...	...	...	...	2	35	43	8
VI.	Apoplexy, Hemiplegia	164	1	...	1	1	...	2	4	11	30	48	50	15	1
	Epilepsy	21	...	1	2	1	2	1	1	4	2	4	2	1	...
	Convulsions	101	82	19	...	...	...	...	...	...	...	...	...	...	...
	Brain and Nervous Dis. (other)	259	39	41	11	4	8	2	14	28	36	31	32	12	1
	Heart Diseases	523	6	5	6	8	11	10	24	72	108	126	99	44	4
	Croup	6	...	6	...	...	...	...	...	...	...	...	...	...	...
	Bronchitis	587	161	59	5	...	1	1	9	26	68	116	91	47	3
	Pneumonia	949	143	186	22	12	26	39	90	123	120	118	52	15	3
	Respiratory Diseases (other)	89	16	15	1	1	...	3	8	8	20	6	9	2	...
	Digestive Organs (Diseases of)	249	93	25	9	2	3	1	11	21	36	27	17	4	...
	Urinary Organs (Diseases of)	131	2	4	3	1	...	1	7	18	30	29	25	10	1
	Reproductive Organs (Dis. of)	2	...	...	...	...	...	...	...	2	...	...	...	...	...
	Local Diseases (other)	37	4	6	2	2	3	4	4	...	3	3	3	3	...
VII.	Violence	256	51	24	13	7	10	10	29	31	24	23	28	5	1
VIII.	Marasmus, Atrophy	366	326	19	...	...	...	...	...	...	...	2	9	9	1
	Other Ill-defined Causes	135	54	16	...	1	1	2	3	17	14	16	9	2	...

TABLE D.—MANCHESTER, 1899.

CAUSES OF DEATHS AT DIFFERENT LIFE PERIODS—FEMALES.

Classes	CAUSES OF DEATH	All Ages	AGES AT DEATH—IN YEARS												
			UNDER 5 YEARS												
		Total	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	6362	1715	1013	160	83	117	124	379	507	584	688	623	328	41
I.	Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Measles	356	69	265	18	1	...	2	1	...	...	...	...	...	...
	Scarlet Fever	18	...	12	4	1	1	...	...	...	...	...	...	...	...
	Typhus Fever	1	...	...	...	...	...	...	1	...	...	...	...	...	...
	Whooping Cough	127	48	78	1	...	...	...	...	...	...	...	...	...	...
	Diphtheria	41	2	25	12	...	...	1	...	...	1	...	...	...	...
	Membranous Croup	7	...	7	...	...	...	...	...	...	...	...	...	...	...
	Ill-defined Fever	6	...	2	...	...	1	...	1	...	1	...	1	...	...
	Enteric Fever	30	...	2	5	1	2	2	9	4	3	1	1	...	...
	Influenza	119	3	3	...	1	3	3	9	14	27	25	24	6	1
	Simple Cholera	6	3	...	...	...	...	...	...	...	1	2	...	...	...
	Diarrhœa, Dysentery	568	424	112	3	1	...	2	..	3	3	7	4	9	...
	Venereal Affections	22	20	...	...	...	1	...	...	...	...	1	...	...	...
	Erysipelas	15	1	1	...	1	...	...	1	2	4	1	2	2	...
	Pyæmia	6	...	...	...	1	...	2	1	2	...	...	...	...	...
	Puerperal Fever	24	...	...	...	...	1	5	14	4	...	...	...	...	...
	Other Zymotics	3	...	2	...	...	...	...	...	...	1	...	...	...	...
II.	Parasitic Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
III.	Dietetic Diseases, Intemperance	25	...	...	...	...	...	...	2	6	6	6	5	...	...
IV.	Rheumatic Fever	25	...	...	3	5	2	1	9	2	3	...	...	...	...
	Rickets	22	6	15	1	...	...	...	...	...	...	...	...	...	...
	Cancer	264	...	...	...	2	...	2	12	35	78	84	42	8	1
	Tabes Mesenterica	65	33	30	1	1	...	...	...	...	...	...	...	...	...
	Hydrocephalus	66	20	29	7	4	1	1	3	...	1	...	...	...	...
	Phthisis	444	3	11	12	15	36	43	119	117	58	23	7	...	...
	Scrofula, Tuberculosis	72	19	22	7	4	3	1	8	4	2	1	...	1	...
	Constitutional Diseases (other)	63	2	2	3	4	2	6	8	5	10	12	5	3	1
V.	Premature Birth	175	175	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other)	44	40	4	...	...	...	...	...	...	...	...	...	...	...
	Old Age	137	...	...	...	...	...	...	...	...	...	5	49	67	16
VI.	Apoplexy, Hemiplegia	214	2	1	...	...	...	2	4	20	32	62	65	24	2
	Epilepsy	16	...	...	1	...	2	2	1	4	3	1	1	1	...
	Convulsions	92	69	20	...	...	...	1	1	...	1	...	...	...	...
	Brain and Nervous Dis. (other)	234	27	35	16	10	5	3	11	31	24	34	23	14	1
	Heart Diseases	567	3	2	8	8	16	12	48	66	96	120	128	55	5
	Croup	6	3	3	...	...	...	...	...	...	...	...	...	...	...
	Bronchitis	703	152	62	7	3	...	1	13	36	76	131	136	77	9
	Pneumonia	587	127	154	20	8	12	9	35	60	47	58	41	14	2
	Respiratory Diseases (other)	61	4	11	1	...	1	...	6	3	10	15	4	6	...
	Digestive Organs (Diseases of)	294	77	42	11	4	11	11	21	24	27	30	25	11	...
	Urinary Organs (Diseases of)	128	4	3	3	3	3	4	15	24	29	23	12	4	1
	Reproductive Organs (Dis. of)	50	...	1	...	...	4	1	17	16	5	2	3	1	...
	Local Diseases (other)	40	7	5	1	2	4	2	...	3	4	6	5	1	...
VII.	Violence	171	48	19	12	3	6	5	7	13	19	17	14	7	1
VIII.	Marasmus, Atrophy	331	285	21	...	...	...	...	...	...	1	3	12	8	1
	Other Ill-defined Causes	117	39	12	3	...	...	...	2	9	11	18	14	9	...

TABLE E.

CITY OF MANCHESTER, 1899.—CAUSES OF DEATH IN INFANCY AND CHILDHOOD.

CAUSES OF DEATH	UNDER ONE YEAR			Total under One Year	ONE AND UNDER FIVE YEARS				Total under Five Years
	Under 3 months	3–6 months	6–12 months		1–	2–	3–	4–	
All Causes	1,549	817	1,244	3,610	1,172	421	250	162	5,615
Measles	1	9	145	155	295	118	68	26	662
Scarlatina	...	...	1	1	5	9	12	5	32
Whooping Cough	13	20	52	85	81	30	16	10	222
Diphtheria..................... (Memb: Croup)	...	...	4	4	18	12	13	13	60
Fever (various forms)	...	...	...	...	...	1	1	3	5
Diarrhœal Diseases	195	279	366	840	166	31	11	4	1,052
Syphilis	28	8	3	39	3	...	...	...	42
Tabes Mesenterica	14	29	29	72	35	8	3	5	123
Hydrocephalus	7	14	28	49	25	13	10	14	111
Scrofula (other)..............	11	19	26	56	36	13	15	12	132
Premature Birth	367	10	...	377	...	...	...	...	377
Convulsions	102	20	29	151	25	8	3	3	190
Brain Diseases (other)	11	18	40	69	34	16	16	12	147
Lung Diseases	156	152	298	606	308	102	56	30	1,102
Teething	...	4	30	34	23	1	...	...	58
Atrophy, Marasmus	381	142	88	611	34	5	1	...	651
Found Dead in Bed.........	74	30	10	114	3	1	...	1	*119
Suffocation	...	2	...	2	...	2	...	...	4
Violence (other forms)	2	3	3	8	6	17	7	11	49
Ill-defined Causes...........	41	9	18	68	18	3	2	...	91
Unclassified	147	53	78	278	59	31	16	13	397

* 65 of these were "Found dead in bed, suffocated."

TABLE F, 1871 TO 1899.—MANCHESTER.—ESTIMATED POPULATIONS. ANNUAL RATES OF MARRIAGES, BIRTHS, AND DEATHS (*a*) from all causes, and (*b*) from specified causes; also the percentages to total deaths of Inquest Cases, and of Deaths in Public Institutions.

YEARS	Estimated Populations — (Mean)	Persons Married	ANNUAL RATES PER 1,000 PERSONS LIVING													PERCENTAGES TO TOTAL DEATHS		YEARS
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhœa and Dysentery	English Cholera	Violence	Inquest Cases	Deaths in Public Institutions	
Quinquennial Averages 1871–75	477,344	24·6	38·9	28·3	0·26	0·64	1·08	0·08	0·78	0·14	0·43	0·21	1·92	0·03	0·94	7·2	13·4	1871–75 Quinquennial Averages
1876–80	509,802	18·6	38·7	26·2	0·24	0·53	1·07	0·13	0·84	0·08	0·29	0·11	1·22	0·04	0·89	7·5	14·3	1876–80
1881–85	542,746	17·9	35·1	23·6	0·04	0·71	0·48	0·10	0·68	0·05	0·20	0·03	0·96	0·03	0·72	7·0	15·9	1881–85
1886–90	575,630	16·6	33·4	24·6	0·02	0·83	0·50	0·32	0·54	0·02	0·30	0·01	1·06	0·02	0·78	6·9	17·7	1886–90
1891–95	517,801	16·9	33·2	23·6	0·03	0·62	0·26	0·27	0·64	0·00	0·24	0·01	1·14	0·05	0·77	7·1	19·2	1891–95
Avge. 25 yrs. 1871–95	524,664	18·9	35·8	25·3	0·11	0·66	0·68	0·18	0·70	0·06	0·29	0·07	1·26	0·03	0·82	7·1	16·1	1871–95 Avge. 25 yrs.
1871	464,866	24·2	38·1	29·3	0·72	0·84	0·71	0·04	0·61	0·20	0·45	0·35	2·58	0·02	0·90	6·3	13·7	1871
1872	471,023	25·8	39·3	27·3	0·32	0·33	1·02	0·09	1·22	0·17	0·40	0·17	2·07	0·04	0·90	6·9	13·5	1872
1873*	477,261	24·8	38·3	28·0	0·08	0·85	1·43	0·05	0·38	0·15	0·46	0·20	1·92	0·05	0·83	7·3	12·8	1873*
1874	483,582	23·8	39·3	28·7	0·05	0·62	1·33	0·07	0·83	0·08	0·39	0·19	1·71	0·01	0·94	7·3	13·5	1874
1875	489,987	24·2	39·5	28·4	0·11	0·54	0·92	0·14	0·88	0·11	0·44	0·12	1·32	0·01	1·12	8·4	13·3	1875
1876	496,476	20·2	40·0	28·0	0·80	0·65	1·13	0·10	0·81	0·16	0·42	0·17	1·50	0·02	1·05	7·4	14·4	1876
1877	503,051	19·8	39·5	26·1	0·36	0·59	1·05	0·13	0·84	0·11	0·29	0·12	0·82	0·01	0·86	7·9	14·9	1877
1878	509,714	18·8	39·7	26·8	0·01	0·45	1·07	0·14	0·68	0·06	0·31	0·10	1·42	0·07	0·91	7·6	14·4	1878
1879*	516,464	16·8	37·3	25·2	0·00	0·35	1·07	0·13	1·09	0·02	0·18	0·07	0·62	0·01	0·81	7·3	14·2	1879*
1880	523,304	17·2	36·9	25·0	0·01	0·63	1·03	0·14	0·76	0·04	0·26	0·07	1·73	0·09	0·80	7·1	13·7	1880
1881	530,051	17·8	35·9	22·8	0·03	0·29	0·34	0·09	0·71	0·03	0·17	0·06	0·73	0·02	0·84	8·1	15·9	1881
1882	536,324	18·8	35·7	24·0	0·05	0·89	0·34	0·11	0·87	0·10	0·25	0·04	1·00	0·03	0·67	7·2	14·5	1882
1883	542,671	17·8	34·9	24·4	0·01	0·71	0·81	0·11	0·62	0·05	0·20	0·03	0·95	0·03	0·73	7·0	15·5	1883
1884*	549,093	18·0	34·4	23·4	0·01	0·57	0·74	0·08	0·49	0·03	0·19	0·03	1·46	0·05	0·65	6·2	17·3	1884*
1885	555,591	17·0	34·8	23·6	0·08	1·08	0·17	0·10	0·71	0·04	0·17	0·01	0·64	0·02	0·69	6·4	16·4	1885
1886	562,166	16·4	34·7	24·1	0·00	0·27	0·41	0·15	0·57	0·03	0·29	0·01	1·34	0·04	0·71	7·2	17·0	1886
1887	568,819	16·6	33·9	25·4	0·01	1·54	0·63	0·23	0·50	0·02	0·31	0·01	1·19	0·02	0·77	6·9	16·1	1887
1888	575,550	16·0	33·3	23·3	0·07	0·27	0·42	0·36	0·79	0·02	0·33	0·02	0·71	0·01	0·74	6·7	18·3	1888
1889	582,362	17·0	33·1	24·2	0·00	1·22	0·45	0·51	0·45	0·01	0·31	0·01	1·00	0·03	0·89	6·5	18·2	1889
1890*	589,253	17·0	31·8	26·2	...	0·83	0·60	0·36	0·37	0·01	0·27	0·02	1·04	0·02	0·79	7·0	19·1	1890*
1891†	‡508,673	17·2	33·8	26·0	...	0·43	0·22	0·25	1·02	0·01	0·37	0·01	0·81	0·04	0·79	6·8	18·4	1891†
1892†	‡513,196	17·2	33·4	23·2	0·00	0·72	0·27	0·25	0·72	0·00	0·24	0·01	0·79	0·02	0·77	7·4	18·2	1892†
1893†	‡517,760	16·0	33·4	24·3	0·09	0·57	0·27	0·35	0·46	0·00	0·25	0·01	1·75	0·10	0·76	6·9	18·7	1893†
1894†	‡522,365	16·8	31·8	19·8	0·04	0·42	0·22	0·29	0·55	...	0·17	0·01	0·70	0·02	0·75	7·5	21·3	1894†
1895†	‡527,010	17·4	33·4	24·5	0·00	0·96	0·33	0·21	0·47	...	0·18	0·01	1·66	0·06	0·80	6·9	19·2	1895†
1896†*	‡531,697	18·3	32·8	22·0	...	1·05	0·37	0·15	0·66	0·00	0·22	0·01	1·04	0·02	0·71	7·4	19·7	1896†*
1897†	‡536,426	17·8	32·9	22·4	...	1·17	0·23	0·08	0·56	0·00	0·18	0·00	1·74	0·06	0·68	6·6	20·0	1897†
1898†	‡541,296	18·3	32·3	21·2	...	0·50	0·12	0·09	0·31	...	0·22	0·01	1·96	0·06	0·69	7·0	19·5	1898†
1899†	‡546,010	18·4	32·2	23·9	...	1·28	0·08	0·16	0·42	0·00	0·13	0·01	2·02	0·03	0·78	7·0	19·7	1899†

* The facts for these years are for 53 instead of 52 weeks; corrections have, therefore, been made in calculating the rates.

† The populations and rates for the years subsequent to 1890, except the marriage rates, relate to the City of Manchester as enlarged by the Act of that year. The facts and rates for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

‡ These figures include a proportion of the inmates of certain Extra-municipal Institutions which receive patients from the City of Manchester, and are therefore in excess of the estimates of the Registrar-General.

TABLE G, 1881 TO 1899.—MANCHESTER.

ANNUAL RATES OF MORTALITY FROM CERTAIN CAUSES OF DEATH.

	Year	Annual Rates per 1,000 Persons living										Rates per 1,000 Births	
		Cancer	Tabes Mesenterica	Phthisis	Other Tuber: Diseases	Diseases of Nervous System	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Urinary System	Diseases of Generative System	Puerperal Fever	Childbirth
Quinquennial Periods	1881–85	0·50	0·35	2·42	0·57	3·28	1·37	5·41	1·23	0·48	0·08	3·03	1·99
	1886–90	0·64	0·36	2·24	0·59	3·09	1·73	5·76	1·23	0·61	0·08	3·22	2·13
	1891–95	0·62	0·22	2·09	0·75	2·50	1·75	5·56	1·07	0·52	0·07	2·75	3·42
Average 15 years	1881–95	0·58	0·31	2·25	0·63	2·96	1·61	5·58	1·18	0·54	0·08	3·00	2·52
	1881	0·48	0·28	2·46	0·52	3·33	1·19	5·57	1·24	0·39	0·07	3·15	1·37
	1882	0·44	0·40	2·41	0·61	3·35	1·34	5·33	1·19	0·45	0·08	3·92	1·62
	1883	0·54	0·34	2·54	0·59	3·32	1·33	5·66	1·20	0·50	0·06	2·27	1·58
	1884*	0·51	0·39	2·34	0·56	3·27	1·44	4·88	1·23	0·59	0·10	2·81	2·55
	1885	0·51	0·36	2·34	0·56	3·12	1·53	5·59	1·28	0·49	0·08	3·05	2·84
	1886	0·56	0·43	2·44	0·59	3·30	1·53	5·43	1·26	0·57	0·08	2·67	1·85
	1887	0·62	0·39	2·19	0·53	3·17	1·66	5·72	1·23	0·53	0·08	3·58	1·35
	1888	0·65	0·31	2·14	0·62	3·19	1·72	5·31	1·16	0·62	0·10	4·12	1·77
	1889	0·70	0·36	2·12	0·59	2·94	1·79	5·06	1·28	0·64	0·08	3·06	1·87
	1890*	0·65	0·33	2·33	0·62	2·87	1·93	7·28	1·22	0·66	0·08	2·68	3·89
	1891†	0·63	0·25	2·20	0·78	3·10	1·89	6·77	1·03	0·55	0·07	3·08	4·01
	1892†	0·61	0·21	2·05	0·75	2·44	1·84	5·44	1·14	0·53	0·05	3·79	4·54
	1893†	0·59	0·26	2·05	0·76	2·51	1·66	5·53	1·20	0·53	0·07	3·70	3·94
	1894†	0·66	0·18	1·97	0·67	2·19	1·58	4·35	0·96	0·49	0·04	1·93	2·77
	1895†	0·63	0·22	2·16	0·77	2·28	1·79	5·73	1·04	0·49	0·11	1·25	1·82
	*1896†	0·66	0·13	2·00	0·60	2·02	1·75	5·19	1·04	0·46	0·11	0·96	1·47
	1897†	0·74	0·22	2·12	0·67	2·02	1·74	4·51	1·03	0·51	0·10	2·10	1·36
	1898†	0·73	0·19	1·95	0·67	1·94	1·94	4·27	1·00	0·54	0.09	1·72	1·54
	1899†	0·75	0·24	2·05	0·61	2·02	2·00	5·47	0.99	0·47	0·10	1·37	1·54

* The facts for these years are for 53 instead of 52 weeks; corrections have therefore been made in calculating the rates.

† The rates of mortality for the years subsequent to 1890 refer to the City of Manchester as enlarged by the Act of that year. The rates for 1890 and for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

TABLE H, 1899.—POPULATION, AREA, DENSITY. TOTAL BIRTHS AND DEATHS, WITH BIRTH AND DEATH RATES.

[INSTITUTION POPULATIONS, BIRTHS AND DEATHS, DISTRIBUTED.]

	STATISTICAL DIVISIONS	Estimated Population	Area in Acres	Persons to an Acre	BIRTHS		DEATHS	
					Total	Rate per 1,000	Total	Rate per 1,000
	City of Manchester	**546,010**	**12,910**	**42**	**17,574**	**32·19**	**13,046**	**23·89**
I.	Manchester Township	144,665	1,646	88	4,786	33·08	4,436	30·66
II.	North Manchester	147,846	7,321	20	5,135	34·73	2,977	20·14
III.	South Manchester	253,499	3,943	64	7,653	30·19	5,633	22·22
I	Ancoats	45,219	400	113	1,694	37·46	1,457	32·22
	Central	35,467	748	48	915	25·80	992	27·97
	St. George's	63,979	498	128	2,177	34·03	1,987	31·06
II.	Cheetham	31,688	919	35	1,196	37·74	496	15·65
	Crumpsall	10,282	733	14	197	19·16	136	13·23
	Blackley	8,297	1,840	5	226	27·24	161	19·40
	Harpurhey	13,205	193	68	551	41·73	314	23·78
	Moston	7,091	1,297	5	309	43·58	156	22·00
	Newton Heath	37,974	1,350	28	1,158	30·49	781	20·57
	Bradford	23,772	288	82	857	36·05	577	24·27
	Beswick	11,161	96	116	431	38·62	233	20·88
	Clayton	4,376	605	7	210	47·99	123	28·11
III.	Ardwick	38,143	509	75	1,378	36·13	910	23·86
	Openshaw	33,143	581	57	936	28·24	601	18·13
	West Gorton	28,570	318	90	1,003	35·11	628	21·98
	Rusholme and Kirk.	20,160	1,412	14	559	27·73	341	16·91
	Chorlton-upon-Medlock	62,086	646	96	1,415	22·79	1,335	21·50
	Hulme	71,397	477	150	2,362	33·08	1,818	25·46

TABLE J, 1899.

Births Registered in the City of Manchester, in its Main Divisions and in Districts; Distinguishing Legitimate and Illegitimate Births; also the Proportion of Mortality among Infants of both Classes under One Year of Age.

STATISTICAL DIVISIONS	BIRTHS		Percentage of Illegitimate Births to Total Births	DEATHS UNDER 1 YEAR		PROPORTION OF DEATHS UNDER 1 YEAR PER 1,000 BIRTHS		
	Total	Illegitimate		Total	Of Illegitimate Children	Total	Legitimate	Illegitimate
City of Manchester......	**17,574**	**725**	**4·13**	**3,610**	**308**	**205**	**196**	**425**
I. Manchester Township	4,786	206	4·30	1,161	99	243	232	481
II. North Manchester... ..	5,135	145	2·82	886	62	172	165	428
III. South Manchester	7,653	374	4·88	1,563	147	204	195	393
I. Ancoats	1,694	47	2·78	406	24	240	232	511
Central	915	68	7·44	219	33	239	220	485
St. George's	2,177	91	4·18	536	42	246	237	462
II. Cheetham	1,196	28	2·34	124	12	104	96	429
Crumpsall	197	7	3·56	33	6	168	142	857
Blackley...............	226	6	2·66	35	1	155	155	167
Harpurhey............	551	15	2·72	108	5	196	192	333
Moston	309	4	1·29	46	3	149	141	750
Newton Heath	1,158	34	2·94	227	12	196	191	353
Bradford	857	37	4·32	193	17	225	215	459
Beswick	431	7	1·62	73	2	169	168	286
Clayton	210	7	3·33	47	4	224	212	571
III. Ardwick	1,378	63	4·57	296	31	215	202	492
Openshaw	936	23	2·46	202	13	216	207	565
Gorton (West)	1,003	50	4·99	217	26	216	200	520
Rusholme and Kirk.	559	26	4·65	81	4	145	144	154
Chorlton-on-Medlock	1,415	86	6·08	304	29	215	207	337
Hulme	2,362	126	5·33	463	44	196	187	349

TABLE K, 1899.

INFANTILE MORTALITY IN THE CITY, AND ITS THREE MAIN DIVISIONS.

DEATH-RATES UNDER ONE YEAR PER 1,000 BIRTHS.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes	205·42	242·58	172·54	204·23
Measles	8·82	14·83	7·79	5·75
Whooping Cough	4·84	2·72	5·26	5·88
Other Com: Infectious Diseases†	0·28	0·21	0·58	0·13
Diarrhœal Diseases	47·79	55·58	42·84	46·25
Tubercular Diseases‡	10·07	10·45	7·01	11·89
Convulsions	8·59	9·40	6·23	9·67
Other Nervous Diseases§	3·93	4·18	3·70	3·92
Lung Diseases	34·48	43·25	27·26	33·84
Wasting Diseases ‖	56·22	66·03	48·10	55·53
Suffocation	0·11	0·21	...	0·13
Found dead in bed	6·49	10·03	2·73	6·79

† These are Smallpox, Scarlatina, Diphtheria, Membranous Croup, and various forms of "Fever," including the chief forms of Typhus and Typhoid.

‡ These are Phthisis, Tubercular Meningitis (Hydrocephalus), Tabes Mesenterica, and General Tuberculosis (Scrofula).

§ These are Meningitis, and other diseases of the Brain and Spinal Cord.

These are Premature Birth, and such ill-defined causes as Atrophy, Marasmus, Debility, Inanition, &c.

TABLE L, 1899.—CITY OF MANCHESTER. ANNUAL RATES OF MORTALITY PER 1,000 PERSONS LIVING AT ALL AGES, IN THE CITY OF MANCHESTER AND IN ITS STATISTICAL DIVISIONS, FROM CERTAIN DISEASES AND GROUPS OF DISEASES.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester	City of Manchester Average of 8 years 1891-98
All Causes	23·89	30·66	20·14	22·22	22·89
Smallpox	...	...	...	...	0·02
Measles	1·28	2·35	1·22	0·71	0·73
Scarlet Fever	0·08	0·08	0·09	0·09	0·25
Typhus Fever	0·00	...	...	0·00	0·00
Whooping Cough	0·42	0·41	0·50	0·37	0·59
Diphtheria, Membranous Croup	0·16	0·12	0·26	0·11	0·21
Ill-defined Fever	0·01	0·01	0·01	0·02	0·01
Enteric Fever	0·13	0·15	0·11	0·14	0·23
Influenza	0·40	0·45	0·34	0·41	0·26
Diarrhœal Diseases	2·05	2·60	2·00	1·78	1·35
Erysipelas	0·05	0·06	0·03	0·06	0·05
Pyæmia	0·02	...	0·02	0·03	0·02
Puerperal Fever	0·04	0·02	0·09	0·03	0·08
Rheumatic Fever	0·07	0·03	0·13	0·06	0·08
Rickets	0·08	0·05	0·03	0·12	0·07
Cancer	0·75	0·93	0·55	0·75	0·66
Tabes Mesenterica	0·24	0·34	0·18	0·21	0·21
Hydrocephalus	0·28	0·26	0·27	0·29	0·33
Phthisis	2·05	3·09	1·34	1·86	2·06
Scrofula, Tuberculosis	0·34	0·32	0·24	0·40	0·38
Premature Birth	0·69	0·74	0·65	0·69	0·60
Old Age	0·41	0·44	0·37	0·42	0·47
Brain and Nervous Diseases	2·02	2·29	1·83	1·96	2·31
Heart Diseases	2·00	2·40	1·31	2·17	1·77
Bronchitis	2·36	3·35	1·74	2·17	2·43
Pneumonia	2·81	4·02	2·26	2·45	2·40
Respiratory Diseases (other)	0·30	0·24	0·36	0·29	0·38
Digestive Organs (Diseases of)	0·99	1·13	0·78	1·05	1·06
Urinary Organs (Diseases of)	0·47	0·54	0·43	0·47	0·51

TABLE M, 1899.—CITY OF MANCHESTER.—ANNUAL RATES OF MORTALITY AT SIX GROUPS OF AGES, * PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH	Under 5 Years	5 to 15 Years	15 to 25 Years	25 to 45 Years	45 to 65 Years	Over 65 Years
All Causes	81·95	3·88	4·86	12·06	37·26	128·25
Smallpox	...	...	...	...	...	...
Measles	9·66	0·28	0·02	0·01	...	...
Scarlatina	0·47	0·10	0·01	0·01	...	...
Diphtheria, Memb. Croup	0·88	0·18	0·01	0·01	0·01	...
Whooping Cough	3·24	0·04	...	...	...	...
Typhus	...	...	...	0·01	...	...
Fever .... Enteric	0·04	0·07	0·24	0·16	0·11	0·07
Continued	0·03	...	0·01	0·01	0·03	0·07
Diarrhœal Diseases	15·35	0·06	0·04	0·04	0·34	1·93
Tubercular Diseases	5·34	0·89	1·76	3·75	3·86	2·72
Brain	4·92	0·39	0·27	0·85	4·22	17·53
Heart	0·23	0·25	0·44	1·33	6·16	23·97
Diseases of ... Lungs	16·08	0·66	0·84	2·64	10·75	36·57
Digestive System	3·46	0·21	0·24	0·49	1·64	4·08
Urinary System	0·19	0·08	0·07	0·40	1·52	3·79
Other Diseases	22·21	0·70	0·92	2·38	8·69	37·50

* For death-rates at all ages, see Table L.

TABLE N, 1899.—ANNUAL RATES OF MORTALITY IN STATISTICAL DIVISIONS, AT SIX GROUPS OF AGES,* PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH		Under 5 Years			5 to 15 Years			15 to 25 Years		
		Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes		106·61	72·43	73·53	4·74	3·51	3·64	5·69	4·44	4·65
Smallpox		...	...	...	...	...	...	...	...	...
Measles		17·86	8·58	5·56	0·44	0·38	0·13	0·07	...	...
Scarlatina		0·33	0·47	0·55	0·16	0·09	0·07	...	...	0·02
Diphtheria, Memb. Croup		0·83	1·50	0·51	0·06	0·26	0·20	...	0·03	...
Whooping Cough		3·21	3·67	2·99	0·06	0·03	0·04	...	...	...
Fever	Typhus	...	...	...	...	...	...	...	...	...
	Enteric	...	0·05	0·06	0·06	0·03	0·09	0·17	0·20	0·31
	Continued	0·06	...	0·03	...	...	...	0·03	...	...
Diarrhœal Diseases		19·46	14·53	13·47	0·06	0·03	0·07	0·03	0·03	0·04
Tubercular Diseases		6·19	4·03	5·66	1·04	0·84	0·82	2·01	1·69	1·65
Diseases of	Brain	5·14	4·29	5·18	0·54	0·32	0·34	0·38	0·20	0·25
	Heart	0·33	0·16	0·23	0·51	0·12	0·18	0·56	0·40	0·41
	Lungs	21·40	13·49	14·60	0·92	0·55	0·57	1·21	0·70	0·72
	Digestive System	4·76	2·95	3·02	0·16	0·20	0·25	0·21	0·23	0·25
	Urinary System	0·28	0·16	0·16	0·13	0·09	0·05	0·07	0·07	0·08
Other Diseases		26·76	18·61	21·81	0·60	0·58	0·82	0·94	0·89	0·93

CAUSES OF DEATH		25 to 45 Years			45 to 65 Years			Over 65 Years		
		Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes		16·49	9·25	11·11	48·30	28·82	35·25	147·61	109·20	128·67
Smallpox		...	...	...	...	...	...	...	...	...
Measles		...	0·02	...	...	...	...	...	...	...
Scarlatina		...	0·02	...	...	...	...	...	...	...
Diphtheria, Memb. Croup		...	...	0·01	...	...	0·03	...	...	...
Whooping Cough		...	...	...	...	...	...	...	...	...
Fever	Typhus	...	...	0·01	...	...	...	...	...	...
	Enteric	0·26	0·14	0·12	0·15	0·16	0·06	...	...	0·15
	Continued	...	...	0·01	...	...	0·06	...	0·27	...
Diarrhœal Diseases		0·05	0·05	0·03	0·54	0·11	0·35	2·32	2·18	1·60
Tubercular Diseases		5·43	2·58	3·44	6·15	1·61	3·71	6·08	1·36	1·75
Diseases of	Brain	1·02	0·84	0·75	5·37	3·97	3·65	16·79	16·93	18·23
	Heart	1·66	0·77	1·45	7·67	4·13	6·37	23·73	18·02	27·28
	Lungs	4·18	1·85	2·20	14·85	8·96	9·25	48·91	27·03	35·45
	Digestive System	0·50	0·29	0·59	1·46	1·13	2·03	4·34	3·00	4·52
	Urinary System	0·47	0·46	0·34	1·71	1·45	1·44	3·47	2·46	4·67
Other Diseases		2·94	2·22	2·15	10·50	7·30	8·37	41·97	37·95	35·01

* For death-rates at all ages, see Table L.

TABLE O, 1899.

MANCHESTER.—Certification of the Causes of Death in the Main Divisions and in Districts.

	STATISTICAL DIVISIONS.	Total Deaths	Certified by		Not Certified	Proportion per cent. of Deaths		
						Certified by		
			Registered Medical Practitioners	Coroner		Regist'd Medical Practitioners	Coroner	Not Certified
	City of Manchester	**13,046**	**12,020**	**915**	**111**	**92·1**	**7·0**	**0·9**
I.	Manchester Township...	4,436	4,047	333	56	91·2	7·5	1·3
II.	North Manchester	2,977	2,803	160	14	94·1	5·4	0·5
III.	South Manchester	5,633	5,170	422	41	91·8	7·5	0·7
I.	Ancoats	1,457	1,340	93	24	92·0	6·4	1·6
	Central	992	878	105	9	88·5	10·4	0·9
	St. George's	1,987	1,829	135	23	92·0	6·8	1·2
II.	Cheetham	496	464	30	2	93·6	6·0	0·4
	Crumpsall	136	129	6	1	94·9	4·4	0·7
	Blackley	161	155	5	1	96·3	3·1	0·6
	Harpurhey	314	301	11	2	95·9	3·5	0·6
	Moston	156	151	4	1	96·8	2·6	0·6
	Newton Heath	781	723	55	3	92·6	7·0	0·4
	Bradford..................	577	538	35	4	93·2	6·1	0·7
	Beswick	233	222	11	...	95·3	4·7	...
	Clayton	123	120	3	...	97·6	2·4	...
III.	Ardwick	910	829	75	6	91·1	8·2	0·7
	Openshaw	601	561	35	5	93·4	5·8	0·8
	Gorton (West)	628	586	34	8	93·3	5·4	1·3
	Rusholme and Kirk. ...	341	311	28	2	91·2	8·2	0·6
	Chorlton-upon-Medlock	1,335	1,218	105	12	91·2	7·9	0·9
	Hulme	1,818	1,665	145	8	91·6	8·0	0·4

TABLE P, 1899.—PARTICULARS AS TO MANCHESTER PATIENTS UNDER TREATMENT IN THE SEVERAL FEVER HOSPITALS DURING THE YEAR; ALSO OF PATIENTS FROM OUTSIDE DISTRICTS SENT TO MONSALL AND CLAYTON DURING THE SAME PERIOD.

DISEASE	HOSPITAL	In Hospital commencement of year	Admitted	Discharged	Died	Remaining in Hospital close of year
SMALLPOX	Clayton Hospital	...	2	2	...	...
	Total	...	2	2	...	...
SCARLET FEVER ...	Monsall	103	1106	827	38	344
	Other Hospitals.........	...	...	...	...	...
	Total	103	1106	827	38	344
DIPHTHERIA	Monsall	17	105	73	28	21
	Other Hospitals	...	7	1	6	...
	Total	17	112	74	34	21
ENTERIC FEVER...	Monsall	77	252	264	32	33
	Other Hospitals	7	18	14	8	3
	Total	84	270	278	40	36
TYPHUS FEVER ...	Monsall	...	1	1	...	...
	Other Hospitals	...	2	1	1	...
	Total	...	3	2	1	...
OTHER ACUTE DISEASES	Monsall	10	142	121	18	13
	Other Hospitals	...	1	1	...	...
	Total	10	143	122	18	13
ALL DISEASES......................		214	1,636	1,305	131	414

PATIENTS SENT TO MONSALL, FROM DISTRICTS OUTSIDE THE CITY, DURING THE YEAR 1899.

DISEASE	Withington	Stretford	Moss Side	Swinton, &c.	Sale	Prestwich	Gorton	Failsworth	Other Districts
Smallpox	...	...	...	...	...	...	...	...	...
Scarlatina	18	6	20	...	20	10	1	...	...
Diphtheria	5	1	4	...	6	...	...	...	...
Enteric Fever	7	2	6	...	...	...	4	1	...
Other Diseases...............	3	...	1	...	...	...	...	...	...

Total, 115.

TABLE Q, 1899.—WORK OF SANITARY DEPARTMENT FOR THE YEAR.

		TOWNSHIPS																		
		Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey	Moston	Newton	Bradford	Beswick	Clayton	Ardwick	Openshaw	Gorton (West)	Rusholme and Kirkmanshulme	Chorlton-upon-Medlock	Hulme	TOTAL
	Complaints to Sanitary Superintendent ...	651	1,080	1,231	1,802	31	10	30	155	566	103	90	6	192	127	191	104	1,019	1,397	8,785
Inspections of	Dwelling-houses	4,130	6,377	6,165	4,534	1,137	469	1,027	594	3,514	1,534	644	2,133	2,422	2,444	2,017	801	3,171	7,258	50,371
	Newly-infected Dwelling-houses	136	161	244	171	58	32	115	33	152	76	47	56	192	81	84	105	143	207	2,093
	Cellars........................	6	...	10	2	...	...	...	...	...	...	...	...	2	1	5	...	52	7	85
	Schools	49	6	51	30	23	7	2	21	43	28	19	...	26	4	13	4	43	16	385
	Factories and Workshops	87	561	61	28	12	4	1	...	152	7	5	...	6	46	5	...	54	8	1,037
	Lodging-houses	98	256	396	95	6	...	...	...	8	1	16	...	8	...	1	...	38	90	1,013
	Offensive Trades	129	43	53	42	9	5	9	27	98	70	27	39	112	38	46	7	58	50	862
	Dairies and Milkshops..................	89	102	110	159	47	13	31	49	81	126	71	157	130	144	186	17	193	305	2,010
	Bakehouses	197	385	173	276	18	22	81	12	70	88	53	23	174	112	228	99	498	534	3,043
	Canal Boats	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,257
	Slaughter-houses	...	...	...	...	...	...	1	...	4	1	...	...	...	4	1	...	1	3	15
	Tips for Refuse........................	2	5	22	11	6	...	10	43	41	...	13	50	2	39	...	...	1	...	245
	Miscellaneous Inspections	2,857	1,435	1,331	674	480	135	177	625	1,561	1,160	604	672	513	642	325	296	1,069	1,340	15,896
	Factories and Workshops by Shop Hours, &c., Inspectors..................	1,249	5,953	969	2,056	33	20	74	3	196	79	85	23	588	271	385	295	1,733	1,290	15,302
	Shops by Shop Hours, &c., Inspectors	196	649	190	398	32	20	44	...	120	39	88	18	314	226	239	200	557	522	3,852
	Re-inspections of Infected Dwelling-houses	350	400	1,156	496	176	83	271	156	424	202	108	234	332	116	193	204	368	439	5,708
	Rooms Fumigated after Infectious Disease	262	42	287	100	62	51	153	93	353	251	136	53	239	...	2	161	90	188	2,523
	Drains Tested by Water	530	721	545	320	85	79	61	62	529	236	62	11	71	206	181	105	227	269	4,300
Smoke Abatement	Observations made	136	276	113	51	70	5	16	51	163	33	4	47	67	249	31	29	133	66	1,540
	Proceedings before Magistrates	20	53	5	...	1	...	...	1	26	7	...	12	9	10	4	2	34	25	209
Food Adulteration	Samples Collected for Analysis	185	176	146	71	14	13	36	29	114	92	46	29	200	94	113	48	193	185	*1,793
	Proceedings before Magistrates	7	12	10	...	...	...	1	2	8	1	3	...	23	3	...	...	6	7	83
	Ashpits reported to Cleansing Department for emptying	33	50	24	30	691	113	132	149	278	118	...	434	2	226	382	110	99	36	2,907
	Receptacles reported to Cleansing Department for emptying..........................	46	199	83	630	2	3	3	...	50	17	26	64	8	7	7	18	138	75	1,376
	Notices issued for Abatement of Nuisances.	1,461	1,571	1,416	1,152	96	87	192	141	701	330	141	148	544	569	426	280	940	2,007	12,202
	Letters written for Abatement of Nuisances	133	39	129	98	1	2	1	5	59	13	...	13	10	63	31	5	76	80	758
	Reports made to Medical Officer of Health	2,888	2,358	2,713	2,214	412	239	672	355	1,874	1,538	760	415	1,948	1,984	1,774	797	2,386	3,306	28,633
	Legal proceedings taken	34	14	57	15	...	1	2	...	30	1	1	...	4	6	4	...	6	9	184
	Total Nuisances abated	1,353	822	1,406	1,228	113	89	201	97	661	347	141	117	367	463	329	117	609	1,232	9,692
	Number of Cottages under Five Rooms...	7,435	4,964	9.037	729	522	923	688	367	4.409	2,621	1,285	402	4,552	3,510	3,221	826	3,805	8,167	57.463

* 7 Samples from Outside City.

INDEX.

PAGE
Admissions to hospitals 225
Antitoxic serum treatment 181
Area of City and districts in acres ... 218

Bacteriological examination 45, 59, 135
Bakehouses 161
Births 1, 219
,, Illegitimate....................... 219
Birth-rates 1, 218
Blood serum test in enteric fever ... 59
Bronchitis, district rates 17
Butchers' meat, prices of 4

Certification of cause of death 224
Childhood, deaths at 215
Childhood mortality 9
Circulatory system, district rates...... 17
Cleansing Department, work of 201
Closets, condition of 28, 52, 74
,, number of 201
Coal, prices of 4
Common lodging-houses 142–160
Compulsory notification 20
Condition of closets..................28, 52, 74
Consumption 104–125
,, District rates 16
Coroner's inquests........................ 224
Corrected and recorded death-rates in Manchester compared with 33 towns 2
,, in groups of civil parishes. 13

Danger of plague 169
Deaths.. 1, 218
,, in public institutions......... 7
,, from infectious diseases for 9 years 20
,, in age-groups 208–211
,, males 213
,, females 214
,, in infancy 215
,, in childhood 215
Death-rates 1, 218
,, at different ages 8

PAGE
Death-rates corrected and recorded for 33 towns 2
,, gains and losses 5, 6
,, at various age-groups in 1899 compared with Manchester 1891-1898 and England and Wales 1881-1890...... 10
,, recorded and corrected in groups of civil parishes 13
,, in the homes of the people, in workhouses, and in hospitals 14
,, for certain diseases in divisions and districts 16–17
,, in districts 218
,, specified causes 222, 223
Decline mortality 11
Delépine, Prof., investigations by, 45, 59, 135
Density of population 218
Diarrhœa 92–104
,, tables regarding 92–94
,, effect of season............... 95
,, chart 102
Diphtheria 41–54
,, tables regarding 41–43
,, and prevalence in autumn 44
,, and incidence on City ... 44
,, and distribution 44
,, and bacteriological examination 45
,, and return cases 48
,, and direct infection 48
,, and paralytic complications 49–51
,, and influence of schools... 52
,, and relation to food supply 52
,, fouling of the ground and closets 52
,, insanitary conditions associated with 52–54
District mortality 11

Effluvium nuisances 168

PAGE

Enteric fever 54–76
,, tables regarding 54–57
,, seasonal wave............ 58
,, and direct infection...... 59-67
,, and growth of bacillus in the soil 67–69
,, and shell fish 70–72
,, and ice cream 72–73
,, and school infection ... 73
,, and condition of the closets 74–76
Estimated population 1, 3, 218
Excess of births over deaths 1

Fever, scarlet.............................. 23–40
,, enteric 54–76
,, isolation of cases 225
,, bacteriological work............ 45, 59
,, hospital, admissions to......... 225
Flour, price of 4
Food, seizure of unwholesome...... 203–205

Gains and losses 5–6

Heart diseases, district rates 17
Homes of the people, death-rates in 14
Hospitals, fever admissions............ 225
Hospitals, death-rate 14
House Drainage Department 201
Housing of the Working Classes... 162–167

Illegitimacy and mortality 219
Illegitimate births 219
Importation of Plague 169
Infantile deaths 215
Infantile mortality 8, 220
Infectious diseases........................ 20–21
Inquests, Coroner's 224
Insanitary dwellings 162–167
Institution death-rates 14
Isolation hospitals 225
Isolation (special) and treatment of cases of scarlet fever before discharge.................................. 29–33

Jewish Health Visitor — Special Work 172
Jewish Ladies' Society for Visiting the Poor............................ 169

Ladies' Health Society.................. 169
Legislation as to personal cleanliness 168
Lodging-houses, Common............142–160

PAGE

Manchester Union 4
Markets—seizure of unwholesome food 203–205
Married, persons 1
Marriage-rates 1, 216
Maturity, mortality 11
Measles prevalence 77–89
,, tables regarding.............. 77–78
,, and schools 78–89
Membranous croup—see diphtheria.. 41-54
Milk and and tuberculosis............125–141
Monsall Fever Hospital—Report of Medical Superintendent 172–183
Mortality, adolescence.................. 11
,, at ages groups 222–223
,, corrected 2
,, male and female........... 10
,, infantile 220
,, childhood 9, 222, 223
,, and illegitimacy 219
,, comparison in divisions... 218

Nervous diseases, district rates 17
Notification of infectious diseases ... 20–21
Nuisances, effluvium..................... 168

Pail closets..............................28, 52, 74
Pauperism 4
Persons to an acre........................ 218
Personal cleanliness 168
Phthisis...................... 104–125
,, district rates 16
Plague..................................... 169
Pneumonia, district rates............... 17
Population, estimates of 1, 3, 218
,, natural increase of 1
,, density of 218
Provisions, &c., prices of 4
Public institutions, deaths in 7
,, ,, mortality 14

Recorded and corrected death-rates in 33 towns 2
,, in groups of civil parishes 13
Respiratory diseases (other), district rates.................................... 17
Return cases of scarlet fever 29–33

Sanitary Department, work of, 183–201, 226
Scarlet fever 23–40
,, and tables regarding ... 24–27
,, and bacteria in the soil. 27
,, and connection with defective privies 28
,, return cases of............ 29–33
,, and school infection ... 33–40

INDEX—*continued.*

PAGE

School age mortality 9
School Board and measles, &c. 78–89
Seasonal wave, infectious disease ... 58
Sex rates in age groups 10
Seizure of unwholesome food 203–205
Shell fish and enteric fever 70–72
Smallpox................................... 21–23
Summer diarrhœa 92–104

Treatment and special isolation of cases of scarlet fever before discharge 29–33
Tuberculosis.............................104–125
  ,, and milk clauses 125–141
  ,, and district rates 16

PAGE

Typhoid fever—see enteric fever ... 54–76

Uncertified deaths......................... 224
Unhealthy dwellings 162–167

Vital statistics 1–19

Wave, seasonal, of infectious disease 58

Whooping cough, prevalence 90–92
  ,, tables regarding 90–91
Work of Sanitary Department..183–201,226
Workhouse death-rate 14
Working classes, housing of 162–167

Zymotic diseases 20, 21